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Announcement

THE publishers of *Building Age* have purchased *The Builders Journal*, and take pleasure in announcing the consolidation of these two journals under the title, BUILDING AGE *and* THE BUILDERS JOURNAL, beginning with this issue. The monthly schedule of publication will be maintained.

Subscribers to either paper will receive the consolidated publications until expiration of their subscriptions. Subscribers to both will have their subscriptions extended for a total of the two periods for which they have made payment.

BUILDING AGE has been published continuously every month since 1879 —44 years. It is improbable that any other like period will see a greater improvement in building design and construction, and in the development of conveniences, although there will, of course, be changes in the use and application of materials, extension of labor saving devices in the structure itself and in methods of construction, etc., all of which will be a credit to the industry and a benefit to mankind. For during the past two score and four years ginger-bread and jigsaw designs have given way to the present sturdy types of structures, so truly representative of the country. The pump has been replaced by piped water supply; the privy by the modern bathroom, and the coal oil lamp by electric light. The automobile has come into being, bringing with it the private and public garage; the daguerreotype has developed into the motion picture film, and the theatre to present it; the school from a hated children's prison to a place where it is a delight to study and work, and the factory from a drear and depressing place to a building flooded with sunlight and every convenience and safeguard for the employee.

It would be fatuous to say that BUILDING AGE has been responsible for these changes. But it has done such yeoman service in the good cause, that it has been recognized everywhere as America's Standard Authority on Building Construction: it has been used as a text book in almost every well known school and college teaching architecture and building, and it is the most widely quoted building magazine in the world.

THE BUILDERS JOURNAL was America's newest building magazine. It set itself so high and enviable a standard as a quality publication that it quickly attracted to itself many thousands of contractors and architect-builders, who took it to the exclusion of any other paper.

THE union of these two magazines, in which the best features of each will be retained —this union of age, experience, conservatism, prestige and influence, with youth and virility—will make one journal better and stronger and more useful than any one building publication produced heretofore.

Building Age and The Builders Journal

920 Broadway New York

SEE NEXT PAGE

Board of Editorial Advisors

THE publishers of BUILDING AGE and THE BUILDERS JOURNAL have been fortunate in obtaining the cooperation of the recognized experts shown on this page, who constitute our Board of Editorial Advisors. Specific questions are invited, but they must in every instance be addressed to The Editor, not to any member of the Board. This is a service to our subscribers of the greatest value, and is in addition to the usual editorial service.

The publishers feel themselves fortunate, also, in their Editor-in-Chief, Mr. C. G. Peker. His work, as reflected in the columns of this paper, speaks for itself.



Advisor on Finance
WALTER D. STARLER,
Comptroller of Metropolitan Life Insurance Co., N. Y., who has the placing of mortgage loans aggregating over $100,000 to aid in reducing the housing shortage.



Editor-in-Chief
CHARLES G. PEKER
Registered Architect. Member New York Society of Architects; Author of "How to Read Plans," "Practical House Framing," etc.



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Registered Architect; Member of R. C. Hunter & Bro., Architects, New York. A recognized authority on the design of artistic suburban homes.



Legal Advisor
ARTHUR L. H. STREET
Attorney at Law. Expert in cases relating to the building industry. In charge of our Legal Department, giving advice to readers.



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C. W. WILSON
A well-known expert in this line, formerly with Arts & Decoration, in charge of our home decorator's service department.



Advisor on House Painting
A. ASHMUN KELLY
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ISAAC P. HICKS
Building Contractor, Omaha, Neb. Author of "Builders' Guide," "Estimator's Price Book," etc.



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CARL B. EIMER
Member of National Association of Real Estate Boards, New York State Association of Real Estate Boards, Executive Committee Own Your Home Exposition, etc.



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Consulting Mechanical Engineer, Boston, Mass.; Author of "Modern Heating and Ventilation," etc.



Advisor on Sanitation
WILLIAM C. GROENIGER
Consulting Sanitary Engineer, Editorial Staff Press, American Society Sanitary Engineers, etc.



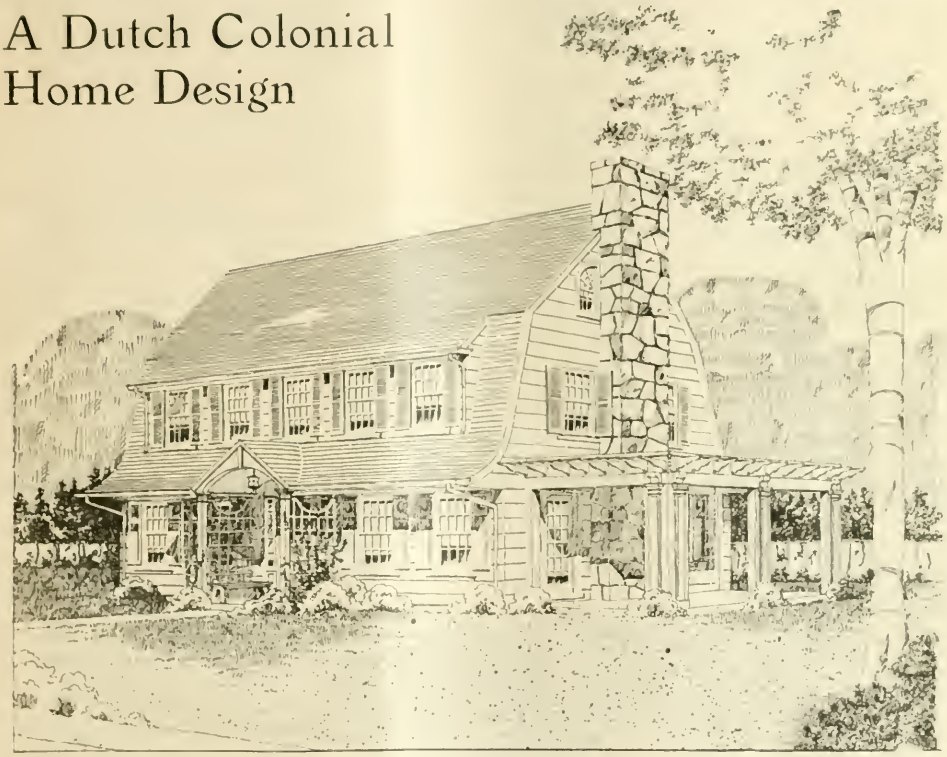
Advisor on Electrical Work
WILLIAM L. GOODWIN
Electrical Engineer, Assistant to President, Society for Electrical Development. Expert on layout of wiring and electrical equipment for the modern building.

See Preceding Page

BUILDING AGE

NEW YORK, JANUARY, 1922

A Dutch Colonial Home Design



An Exceptionally Well Arranged Floor Plan Utilizing Every Foot of Space

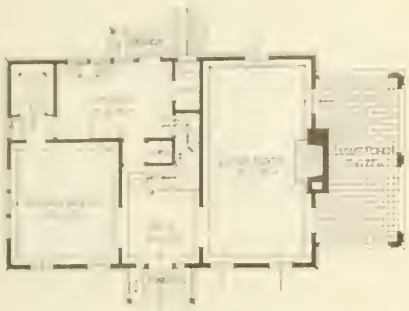
Specially Designed for BUILDING AGE by R. C. HUNTER & BRO., Architects, New York

OUR front cover design shows a comfortable roomy house of Dutch Colonial Architecture with an appearance about it of comfort within, even though the weather is at its worst—a bleak January snow storm. In such a home as this one will surely receive that time honored greeting, "A Happy New Year," with the utmost sincerity.

One's home environment bears a direct relation to one's temperament. A comfortable, artistic home is a joy to all the occupants and they will truly appreciate it the more if they were formerly paying out a big portion of their income for an exorbitant rent in a city apartment.

In the illustration above is a sketch of the same house showing how it appears in the summer—when the flowers are in bloom and the birds are around again with their pleasant song. On the following pages the different floor plans are shown also a complete bill of the materials necessary to build this very comfortable home.

In this design the architects have succeeded in providing the maximum amount of room for the minimum



First Floor Plan



Second Floor Plan

amount of money, consistent, of course, with good architectural design; even a "box" could hardly be built for less money and at the same time give the required room.

As shown on the first and second floor plans, seven rooms have been provided and the attic is of such size so that two extra rooms and a bath can be finished off if desired.

Nine rooms and three baths, with generous halls and ample closet space, all within a rectangular area of forty by twenty-six feet. Nor has anything been cramped to get this number of rooms, in fact, all of the rooms are generous in size.

One enters the house through an inviting entrance porch that has lattice covered sides which will be covered with sweet smelling honeysuckle or roses—a seat on each side is a comfortable resting place for any one making a business or short social call.

A good-sized reception hall is centrally located and the kitchen is reached direct from this so that the housewife can see both front and rear doors while in the kitchen.

The stairs are located in the center of the house where they will best serve all of the rooms with but little hall space and the stairs themselves are of the reverse flight type so that they occupy a minimum of space. The stairs continue from the cellar to the third floor with doors at the first and second floor levels. A coat closet is conveniently located under the first floor stairs. Still it is out of sight from the hall.

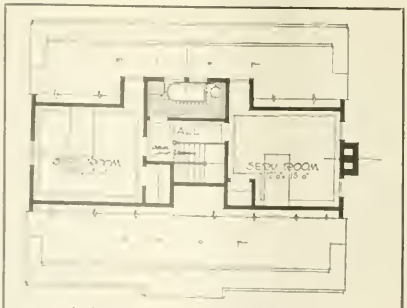
On the first floor the rooms are well arranged about the central hall. The living room is of generous size and the large open fireplace is a distinctive feature with French doors, leading to the porch, on either side.

This living porch is designed so that it can be easily screened for the summer and glassed in for the winter.

The entrance from dining room to kitchen is through a pantry which is provided with plenty of cupboard space for china, etc., and the small sink with window above it will be found an added convenience.

The kitchen sink is placed directly under a window so that there will be plenty of light. A closet at the other side of the kitchen affords room for the refrigerator.

A cellar is provided under the entire house with an outside entrance from the rear. Here a laundry is provided with electric outlets for washing machine and iron; also a special gas outlet for a mangle. A large cold room or pantry is arranged for besides space for heater, etc.



Attic Can Have Two Rooms and Bath

Three bed rooms and two baths are found on the second floor. The large bed room is served by a private bath, while the other bath provides for the other three rooms. All of the bed rooms have closets and a linen closet is also provided. Numerous large windows make the bed rooms bright and cheerful.

As previously mentioned two additional bed rooms and an extra bath may be finished off in the attic or third floor; the plan shows how this can be accomplished—it will be noticed that this arrangement provides an abundance of light and cross ventilation.

The exterior of the house is a pleasing adaption of the Dutch Colonial style. The walls may be finished with wide white shingles and the roof of shingles stained green. Blinds and shutters are painted a deep green.

Of course, if preferred, the exterior of this house can be stuccoed, the construction being either hollow tile or frame. In locations where stone abounds the walls could be built of this material or, if preferred, brick may be used. All would look well.

If preferred the exterior may be covered with wide clapboards or stucco. A brick chimney can be substituted for the stone if desired.

The house shown here was recently built at Tenafly, N. J.

This house would cost to build about $12,000. Complete working plans and specifications of this Dutch Colonial Home will be furnished for a nominal sum by BUILDING AGE.

[Quantity Survey of Dutch Colonial Home

Shown on Preceding Pages

THE quantities given are for estimating. All measurements are NET unless otherwise noted, areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc. Minor outs have been disregarded.

Such items as clearing site, temporary work and protection, scaffolding and general equipment and supplies, have not been included.

Such items as are marked "Unit," are to be estimated in a lump sum, following requirements of plans and specifications.

EXCAVATION

(Excavation for pipe trenches not included)

Excavation for cellar.....310 cu. yds.....
Excavation for footings.....17 cu. yds.....
Excavation for areas.....15 cu. yds.....
Excavation for trench walls.....17 cu. yds.....
Excavation for leader drains and dry wells..13 cu. yds.....
Backfilling around walls, etc.....46 cu. yds.....
Leader drains and dry wells
Field stone for dry wells.....10 cu. yds.....
4" salt glazed tile drain pipe.....36 lin. ft.....
4" elbows.....6.....

MASONRY

Concrete work
Concrete for cellar walls.....930 cu. ft..
Concrete for footings.....300 cu. ft..
Concrete for trench walls.....270 cu. ft..
Concrete for area walls.....130 cu. ft..
Cellar floor (3" concrete and 1" cement finish).....910 sq. ft..
Outside cellar steps (concrete, cement faced).....45 sq. ft..
Area bottoms (brick and sand).....41 sq. ft..
Porch floors (12" cinders, 3" conc. and 1" cem. finish, colored and blocked off).....311 sq. ft..
Concrete forms....2,600 sq. ft..
Pointing cellar window sills.....23 lin. ft..

STONE WORK

Chimney (Native rubble stone facing about 6" thick, 1" joints).....299 sq. ft..
Cap (6" thick, rough).....9 sq. ft..

BRICK WORK

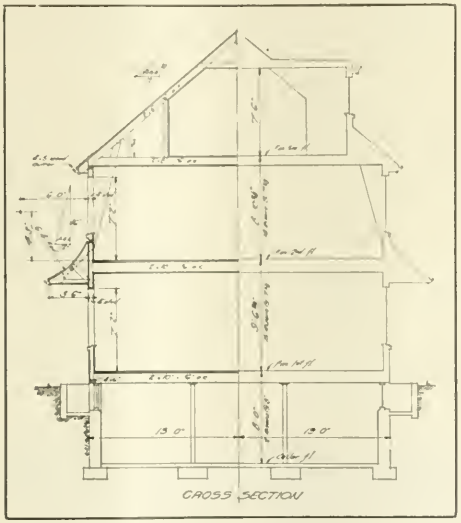
Common brick work for chimney.....180 cu. ft.....
(or 9 M.)
Face brick for hearth and jambs.....20 sq. ft.....
(or 140 brick)
Fire brick for fireplace.....28 sq. ft.....
(or 130 brick)
8" x 12" T. C. flue lining.....40 lin. ft.....
12" x 16" T. C. flue lining.....28 lin. ft.....

MASON'S IRON WORK

Fireplace damper (4'-4" opg., with throat, etc.)....1 unit.....
C. I. ash dump.....1 unit.....
C. I. cleanout door for ash pit (12" x 16").....1 unit.....
C. I. cleanout door for boiler flue (8" x 8").....1 unit.....
Thimble for boiler flue (9" dia).....1 unit.....

PLASTERING

Three coat patent plaster on wood lath, gross.1040 sq. yds.....
(Net 950 sq. yds.)



Keene's cement wainscot on metal lath (behind kitchen range and for 3rd floor bath).....18 sq. yds.....
Keene's cement cap.....24 lin. ft.....
G. I. corner beads.....72 lin. ft ....

TILE WORK

Tile work for bath rooms
Floor (1" hex. white).....50 sq. ft.....
Wainscot (3" x 6" white wall tile)..256 sq. ft.....
6" sanitary base.....30 lin. ft.....

SHEET METAL WORK

Tin roof over living porch.....242 sq. ft....
Tin roof on dormer.....170 sq. ft
Tin flashings for roofs, etc.....167 lin. ft.....
Tin flashing for column caps.....7 lin. ft.....
Tin flashing and counter flashing for chimney..15 lin. ft.....
Tin valley lining.....14 lin. ft.....
4" half round hanging gutter (No. 24 gauge galv. iron).....44 lin. ft.....
3" tin leaders.....98 lin. ft.....
Bends for same.....31.....
Gutter thimbles.....11..
3" x 4" G. I. gas range vent.....26 lin. ft..
Cap and thimble for same..1..

CARPENTRY

Timber
All 1" common stock, hemlock, rough unless noted.

Cellar girders, 6" x 10" spc. 2/16, 1/14, 1/10..280 ft. b. m..
3" x 10" spc., 1/14..35 ft. b. m..
2" x 3" nailer, 130 lin. ft.....65 ft. b. m..
Sills, 4" x 6" 4/16, 2/14, 4/10..264 ft. b. m..
Posts, 4" x 6" 4/18.....144 ft. b. m..
Studs, girts and plates, first floor
2" x 4" 189/10...1260 ft. b. m..
2" x 6" 25/10.....250 ft. b. m..
Porch col. cores 2" x 4" 17/10.....114 ft. b. m..
Studs, etc., second floor
2" x 4" 132/10, 140/8.....163 ft. b. m..
Studs, etc., third floor
2" x 4" 80/10.....530 ft. b. m..
First floor joists
2" x 10" 8/16, 34/14, 4/12, 14/10.....1320 ft. b. m..
Second floor joists
2" x 10" 40/16, 20/12.....1466 ft. b. m.....
Third floor joists
2" x 8" 40/16, 20/12.....1173 ft. b. m.....
Third floor ceiling beams
2" x 4" 20/16.....213 ft. b. m.....
Living porch ceiling beams
2" x 4" 16/12.....128 ft. b. m.....
Living porch and ent. porch rafters
2" x 10" 2/14, 2" x 6" 19/10.....237 ft. b. m.....
Plates
2" x 10" 8/10.....134 ft. b. m.....
Rafters
2" x 6" 64/18, 6/14, 16/10.....1396 ft. b. m.....
Ridge
2" x 8" 3/14.....56 ft. b. m.....
Cornice outlookers
2" x 4" 32/8.....171 ft. b.m.....
2" x 8" (cut to radius) 64/6.....512 ft. b.m.....

Floor bridging
2" x 3" cross bridging ... 300 ft. b. m.
Cellar partitions
2" x 4" studs 16" c. to c. ... 142 ft. b. m.
Sheathing (1⅛" x 8" shiplap)
Walls to cover ... 2430 sq. ft.
Flat roofs to cover ... 413 sq. ft.
Sheathing paper (waterproof) ... 2500 sq. ft.
Shingle laths 4" x 3" ... 4400 lin. ft.
Ground, 1½" x 2" surfaced 1 side ... 300 lin. ft.
Sheathing for cellar partitions
(⅞" x 8" shiplap) to cover ... 311 sq. ft.
Rough flooring (⅞" x 8" shiplap)
First and second floors to cover ... 1950 sq. ft.
Furring (1" x 2") ... 300 lin. ft.
Shingle roofs (18" stained shingles) 18.7 squares
... 12,900 shingles
Shingle sides (24" stained shingles) 20 squares
... 6500 shingles
Exterior finish
Watertable (⅞" x 2" strip) ... 130 lin. ft.
4" x 5" moulded wood gutter ... 155 lin. ft.
Porch ceiling and cornice soffit
(⅝" x 3⅛" N. C. Pine, M. & B.) to cover ... 600 sq. ft.
⅞" x 6" cornice fascia ... 154 lin. ft.
Dormer cornice
⅞" x 6" fascia ... 32 lin. ft.
⅞" x 6" soffit ... 32 lin. ft.
2½" bed mould ... 32 lin. ft.
Porch finish
Ent. porch
6" x 6" box. cols. 8'0" long with cap and base ... 2
Lattice panels, 3'-6" long x 8'0" high ... 2
Portable benches, 3'-6" long ... 2
3" crown mould ... 15 lin. ft.
3" moulded fascia ... 14 lin. ft.
⅞" x 12" soffit ... 9 lin. ft.
Front fascia with key block ... 1
⅝" x 7⅛" cove ... 18 lin. ft.
Living porch
10" paneled pilasters, 8'0" long with caps and bases ... 5
⅞" x 8" (behind pilasters) 13/8 ... 69 ft. b. m.
⅞" x 6" (behind pilasters) 20/8 ... 80 ft. b. m.
6" x 10" brackets ... 5
2" x 8" x 3'6" pergola ends ... 32
2" x 8" wall fascia ... 42 lin. ft.
⅞" x 12" fascia ... 80 lin. ft.
⅞" x 6" soffit ... 40 lin. ft.
2" bed mould ... 40 lin. ft.
⅝" x 7⅛" cove ... 80 lin. ft.
Rear porch
Bench, railing, etc. ... 1 unit.
Cellar bulkhead
⅞" x 4" M. & B. ceiling—to cover ... 50 sq. ft.
7⅛" x 6" fascia ... 20 lin. ft.
⅝" x 7⅛" cove ... 14 lin. ft.
Windows:
Frames complete with sash, outside trim, etc., sash 1⅜" thick, glazed D. T.
Cellar windows.
Single top hung casem. sash, 3'0" x 2'0" 4 light ... 4
Mull. D. H. sash ea. 2'6" x 3'4" 12 light ... 1
First floor windows:
Single D. H. sash, 3'4" x 5'0" 16 light ... 6
Triple D. H. sash ea. 2'6" x 3'4" 12 light ... 2
Single D. H. sash 2'6" x 3'4" 12 light ... 2
Second floor windows:
Single D. H. sash, 3'2" x 4'6" 16 light ... 12
Single D. H. sash, 2'6" x 3'4" 12 light ... 1
Third floor windows:
Single D. H. sash, 2'6" x 3'4" 12 light ... 2
Mull. D. H. sash ea. 2'6" x 3'4" 12 light ... 1
Single D. H. sash, 2'0" x 3'6" curved head ... 2
Curved head ... 2
Single D. H. sash, 2'6" x 4'0" curved head ... 1
Shutters (1⅛" thick, solid paneled):
3'4" x 5'0" pr ... 5 pr.
2'6" x 3'4" pr ... 2 pr.
Blinds (1⅛" thick, movable louvres):
3'2" x 4'6" pr ... 12 pr.
2'6" x 3'4" pr ... 1 pr.
Exterior door frames (1¾" thick, rabbeted):
Front entrance frame, door 3'4" x 7'2", sidelight sash 1'0" x 5'0" with panels below, ornamental trim, etc. 1 unit.
Frame for door to living porch, 2'10" x 7'0" ... 1
Frame for rear entrance door, 2'8" x 7'2" ... 1
Exterior doors (all to detail):
Front entrance door, 3'4" x 7'2" x 1¾", 6 panel ... 1
Door to living porch, 2'10"x7'0"x1¾" glazed D. T. ... 1
Rear door, 2'8"x7'2"x1¾" glazed D. T. ... 1
Finished flooring:
Living room, Dining room, Ent. hall:
Plain sawed white oak, 13/16"x2'4" to cover. 690 sq. ft.
Kitchen, Pantry, etc.:
No. 1 maple, 13/16"x2¼" to cover ... 210 sq. ft.
Second story: No. 1 comb grain Y. P.:
⅞"x2¼" to cover ... 900 sq. ft.
Third story: ⅞"x4" N. C. Pine to cover ... 550 sq. ft.
Lining paper under floors ... 1800 sq. ft.
Cement filled pipe cols. in cellar:
(4" dia. x 7'6" long with caps and bases) ... 7
Joist Hangers (¼"x 2" W. I.):
For 2" x 10" beams ... 6
For 4" x 10" beams ... 4

INTERIOR FINISH

Door trim (Whitewood):
⅞" jambs, ½" stops, ⅞" x 4½" moulded and mitered trim with wall moulding. Trim both sides.
For doors 2'6" x 6'8" ... 8 sets
For doors 2'4" x 6'8" ... 10 set
For doors 2'4" x 7'0" ... 1 set
Trim for inside of exterior doors:
Front entrance with sidelights, etc. ... 1 set
Rear entrance, 2'8" x 7'2" ... 1 set
Door to living porch, 2'10" x 7'0" ... 1 set
Trim for cellar doors (plain) ... 2 sets
Trimmed openings finished same as for doors:
Opg. 5'0" x 6'8" ... 2 sets
Arch opg. to hall with ornamental trim:
Opg. 2'6" x 7'0" ... 1 set
Windows (Whitewood):
⅞" x 4½" moulded and mitered trim with wall moulding. ½" stops. 1⅛" moulded stool. ⅞" moulded apron, ⅝" x ⅞" cove under stool.
For windows, single, 3'4" x 5'0" ... 6 sets
For windows, triple, 2'6" x 3'4" ... 2 sets
For windows, single, 2'6" x 3'4" ... 5 sets
For windows, single, 3'2" x 4'6" ... 12 sets
For windows, mullion, 2'6" x 3'4" ... 1 set
For windows, single, 2'0" x 3'6", curved head ... 2 sets
For windows, single, 2'6" x 4'0", curved head ... 1 set
Base:
⅞" x 6" moulded ... 750 lin. ft.
⅞" x 4" plain (closets) ... 120 lin. ft.
2" base mould ... 750 lin. ft.
½" quarter round floor moulding ... 870 lin. ft.
Picture moulding (⅞" x 2¼") ... 680 lin. ft.
Chair rail in hall (⅞" x 3½") ... 48 lin. ft.
Chair rail in dining room (⅞" x 3½") ... 58 lin. ft.
⅝" x 1¼" wall mouldings to be applied to plaster:
In hall ... 50 lin. ft.
In dining room ... 450 lin. ft.
Mantel for living room ... 1 unit
Interior doors (2 cross panel birch veneer):
Door 2'6" x 6'8" x 1½" ... 8
Door 2'4" x 6'8" x 1½" ... 10
Door 2'4" x 7'0" x 1½" ... 1
—Solid pine cellar doors:
Door 2'6" x 6'6" x 1½" ... 1
Door 2'10" x 6'6" x 1½" ... 1
Whitewood doors:
Door 1'6" x 3'0" x 1⅜" ... 2
Closet shelving (⅞" x 12" pine) ... 62 lin. ft.
Hook strip (⅞" x 4") ... 85 lin. ft.
Rabbeted shelf cleat ... 40 lin. ft.
1" dia. pipe clothes rod ... 20 lin. ft.
Pantry cupboard (front 13'6" x 8'6"):
Countershelf, drawers, doors, etc. ... 1 unit
Main stairs, 1st to 2nd story: (Whitewood) ... 1 flight
Cellar stairs ... 1 flight
Stairs, 2nd to 3rd floor ... 1 flight

Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges, also sub-contracts.



Waiting Station at Santa Barbara Mission, California. Roland F. Sauter, Architect

Beauty with Service

BEAUTY *vs.* SERVICE *in* BUILDING CONSTRUCTION

By JAVIER II ADRIANZEN, Architect

BUILDING AGE has been considered by me a very practical magazine except in the most practical of all things: "Design;" but the last few issues show that BUILDING AGE knows this deficiency and whether conscious, or otherwise, BUILDING AGE is steadily fixing this deficiency and not only fixing it but mastering it.

Let me come to the point: *Beauty vs. Service* has been a subject long discussed and design is no longer devoted to what many believe it to be: just the handling of things that are not essential but merely pleasing.

Beauty and its design cannot exist without service: *A thing is not serviceable if it is not beautiful.* It has not a lasting value if it is not beautiful.

Before you attempt to digest this statement consider these points:

Houses are built for human beings, not for profit, business enterprise, cleverness, etc. You may cheat a human being and do him out of the comforts and service that beauty provides, but that does not mean that you have designed a house serviceable to a human creature. You may make a successful enterprise, but by producing an ugly thing you have absolutely destroyed convenience and serviceability.

Art Without Comfort Is Not Beauty

What is beauty? Beauty, at least in the architectural sense, *is the relation of the three dimensions to a human being.* A beautiful nose for example is the one that has the three dimensions proportioned so that it will render the most efficient service to the human being. A beautiful mouth is the one that has the three dimensions so arranged that produce the best service to its owner. I can mention any number of arguments proving that a perfect mouth is very beautiful and consequently provides the owner of all its conveniences. Review in your mind all the mouths you know, all the eyes you know, all the ears you know, all the limbs you know, all the bodies you know. Imagine a fat short legged man trying to get away from a tiger in a hot sandy place. Imagine another one with legs so long that one gets in the way of the other.



Infirm Persons Need a Hand Rail All the Way Up
Art Without Service

Man has learned that if he is to survive with ease he must have things of his own so proportioned as to give him the greatest amount of service. Those that give the most satisfactory service he calls beautiful because he loves them, he prizes them, he admires them, for with them his life is a real garden of dreams.

Well, what has architectural beauty to do with all this? I may simply answer again—Houses are made for human beings to live in, and if human beings are going to live there, they do not want lack of comfort

or restriction, they want everything that will give them service and consequently comfort, and comfort is obtained by those things beautiful. Could you say that a five foot high door is comfortable? Is it beautiful? Is a two foot high desk beautiful? Ask a six footer how he would like it for his office. How do you feel in a seven foot high ceiling on a hot damp day? How would you like to walk back and forth in the kitchen in order to prepare a meal on an extremely warm evening and find also that in that kitchen you only have a two foot window perched high up about five feet from the floor? Would you like such a kitchen; would you call it beautiful? Would you call it serviceable? Would you call it well proportioned? No, it does not fit the human being and consequently is ugly and lacks serviceability.

Would you call a mustard plaster beautiful, would you call a toothache fine, would you call a sore throat charming, would you associate beauty with anything that gave you discomfort and made you irritable? If you should call all these things beautiful, you ought to live in jail.

Everything in Architecture has relation to man, be it structural, decorative or a matter of service and convenience. Ugly is what is against man. Beautiful is what pleases and gives the greatest degree of comfort to man.

What Is a Beautiful House—What Is an Ugly One?

Would you build for yourself a beautiful house or an ugly one? Do unto others what you want others to do unto you. Do not build for others what you would not want others to build for you. This is enough, I believe, to start you thinking. Let us turn now to the houses.

The most beautiful is the cheapest house. A carpenter told me that it was all right to employ an Architect (not what the State Laws call an architect, but a real one) but *he had not the money*, so he employed a contractor and both decided on the future house. He showed me the plans, etc., and said to me "How could you build it cheaper?" I looked at the plans and my first answer was: "Why, yes, you could have built it cheaper, because you have an extra flight of stairs that you do not need; one door too many and many things to repair. Now, your wife walks 120 feet every time she wants to go to the cellar instead of walking only 20 feet. If she goes to the cellar four times a day, she walks 480 feet instead of 80 feet; in five days a week she walks 2,400 feet instead of 400 feet; besides your dining room is full of cellar dirt and smells and your floor has suffered immensely. Now, five years after its construction, you have paid about twenty times the architect's fee in extra stairs, doors, fixings, family's shoes, tired feet, etc." The Mrs. spoke and he heard the truth from her. By no means, the stairs were not beautiful, nor was the planning, etc., etc.

The average person appreciates and enjoys beauty; everybody does; but mighty few give beauty a chance to render its services and enjoy its comforts.

There is no economy in building ugly houses for they are prison places and consequently demand much money from their dwellers who get sick in sign of protest against their being deprived of beauty and comfort.



Houses Arranged in Courts Offer Service with Beauty

Who Can Decide What Beautiful Is?

WITH due respect to everybody, I do not believe the contractor, the speculator, the promoter, the builder (as he calls himself), or the *law*-made architect can see beauty, for they are not concerned with it. Funny as it may seem, so much profit to your pocket alone can never see beauty. Only the man who studies, has the inclination and the ability and hates to throw a human being into a cell and rob him of his rights to beauty and comfort can decide what beauty means. You may build what the building code allows you for they have no laws compelling beauty and comfort. Does the law of any State



Built at Southern Pines, N. C. Aymar Embury II, Architect

Garage in Harmony with House, There Is Service and Beauty

demand that the licensed architect should know what beauty is; does it demand a certain amount of studies? Many States do not even demand complete High School education; so how can they demand æsthetic education? Architecture in its pure sense is not demanded by any State, they demand practice, not quality and ability to design a beautiful and comfortable house for a human being.

The present laws are more like a *Union Laws* where ability has less importance than submission and protection by-laws, and where a sort of slavery and lack of personality is the all protecting power destructive of initiative and originality.

The following points at random will give an idea of beauty in architecture and its practical value:

1. Beauty has for its rule and judgment the comforts of the human being.

2. The thing that satisfies best the human being and favors him best is the cheapest.

3. What is comfortable, pleasing and serviceable to the human being is beautiful.

4. There is no money saved by torturing a human being, for the expense of overcoming the torture costs a good deal. It will not be cheaper for you to economize on a window, a beautiful door, or ventilation, it will cost you four times the saving and may be you will pay with your death for the economy ill interpreted.

5. As the people grow more and more educated, the value of ugly houses will decrease immensely. You are not wisely investing by buying cheap "automatic machine built promoter developments" of financial successes. You may pay for the successes of others but not your own.

> BUILD FOR BEAUTY whenever you build and you will give the home owner something that is original, comfortable and enjoyable. It will be a house that will sell readily and one that is a good investment as it looks more than its cost.

6. All human beings are made of the same parts, head, trunk, limbs, etc. You seldom will find two human beings alike; why should the houses for the human beings be the same?

7. When you build, build for beauty, for comfort, and your house will be original; you will enjoy it and will have no difficulty in selling. Do not favor the "Cemetery of the living" Type of Architecture or a flat wall with holes like you find in the cemetery of the poor—a hole in the wall for each mortal. You are living, do so and do not allow any unscrupulous promoter to tell you that life in so many holes in the straight flat wall, penitentiary-like, is the greatest of bargains ever obtained. Have your own individuality and taste, and use the right man in helping you to realize your ideals. A doctor helps you to get well, a lawyer gets you out of difficulties (may be). The engineer builds for you that which you have no idea of realizing its possibilities. An Artist flatters you with an oil painting that you could only mess your hands and fingers with if you dared to do it. A true, real architect (not necessarily law-made) but one who knows, has studied and has the ability will help you in realizing your dreams. Reject the saving man who tells you "it is not beautiful, but can be built with the money." He knows nothing, and what he can build with that money a true architect can improve and build cheaper.

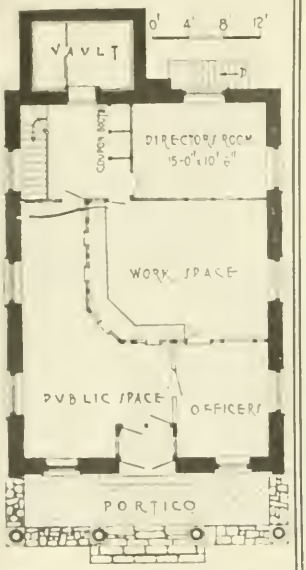
Some folks do not kick in paying big prices to promoters. I have seen some of these people charge $10,000.00 for a house that was not worth $6,000.00, and people paid it because they were fooled and did not know what they were doing. Some said they were saving on the architect. Do not be like a child, that the doctor who restores him to health is the person most feared by him.



Chicken House at Cynwyd, Pa. John L. Coneys, Architect

Practical Features with Unique Design Gives Service with Beauty

Bank of Colonial Design



The Floor Arrangement Is Convenient for Employees and Customers

BUILDERS can impress on the bankers of their community that a dignified modern home is needed for the continued prosperity of a bank.

Show how public confidence is kept by a substantial and inviting bank building. Tell them how it means perpetual publicity.

Impress upon them the duty they owe their community to be leaders in setting a standard for commercial buildings that are beautiful in design and serviceable in daily practical use.



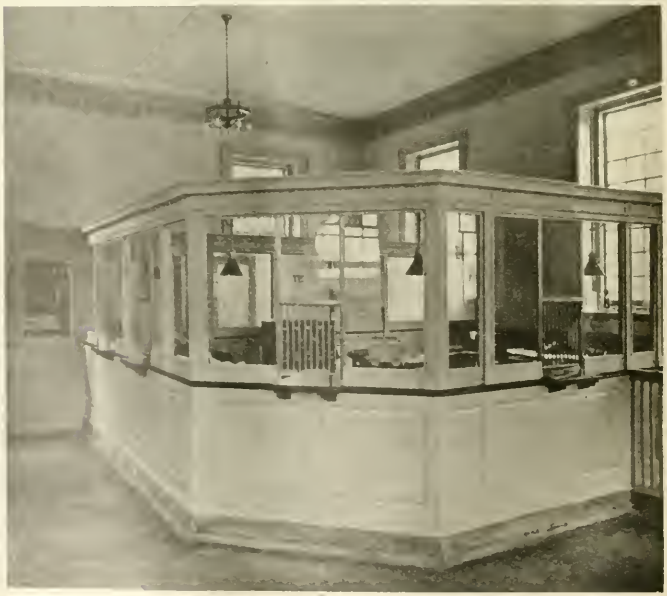
PENNSYLVANIA traditions are largely Colonial, therefore it is not surprising to find modern architects and builders in that state making extensive use of what is known as Colonial architecture for various types of buildings.

The bank illustrated on this page is a dignified example of Colonial design—there is nothing costly or elaborate in its construction—just simple sound sense combined with artistic planning on the part of the architect.

This building was erected for the Huntingdon Valley Trust Co., at Lower Moreland Township, Montgomery County, Pennsylvania. The plans were prepared by Mr. Thomas B. Lippincott, architect, of Philadelphia. Fesmire Bros. were the builders.

While this building has been built of stone the walls could have been of brick or stucco without detracting from the design. Although situated in a small town its excellent arrangement and design compare favorably with many of our city banks..

The interior is dignified and business like; the dividing partitions, counters, etc., are built of wood, as shown in the interior view. Unlike some larger banks there is no bronze or marble fixtures, but the result is equally as pleasing.



How Investors View the Building Situation

Large Amounts of Capital Can Be Made Available for Building Purposes Under Rightful Conditions

By S. W. STRAUS
President, S. W. Straus & Co., Investment Bonds, New York

RESPONDING to your request for a statement concerning the building situation, will say that we believe the situation is improving rapidly, and we know that the public is becoming more interested in first mortgage securities.

The rapidity with which the recent $12,000,000 loan made by us to the General Motors Company, was absorbed by the public shows the potential buying power of the country in this direction, and is an indication of the large amount of capital that can be made available for building purposes under rightful conditions.

Construction work throughout the country is holding up well for this season of the year. The building of small homes is proceeding in a gratifying manner, with special activities reported in the New York district and the South. Estimates of the total of new building contracts for the year indicates that in valuation 1921 will be about equal to 1920 which was the record breaking period for the industry. On a square footage basis, however, it would appear at this time that the 1921 total will be less than 1920.

Will Construction Costs Fall or Rise?

THE most important factor at present is that of construction costs, and opinion prevails that the tendency will not be toward lower levels. It should be borne in mind that the law of supply and demand is an irrevocable factor in all economic situations. It is the final and deciding element. Various official and authentic statistics as to the amount of construction necessary to bring the building situation back to normal have been made from time to time. The most conservative of these estimates places the shortage at about $8,000,000,000. On the present annual basis of new building contracts throughout the country, (about $2,500,000,000) it would require three years of steady building to overcome this shortage even if we had no new demands, deterioration or losses. But as building work now going on is not of sufficient magnitude to make any perceptible change in the general housing status it is quite within the bounds of good judgment to conclude that we are to have a rather prolonged period of very active building.

It is contrary to experience to expect continually falling prices in the face of abnormal demands and activities. Consideration also must be given to the revival of general business in this country, and, eventually, throughout the world. A more optimistic tone, in fact, is being manifested continually.

In addition to these basic conditions, which must certainly have their effect on building costs, it is to be remembered that there are heavy burdens of taxation to be met, that great projects of public works which will demand heavy supplies of labor and materials are pending, and that there is a continued development toward better standards of living and greater conveniences, which mean higher prices.

While there will be fluctuations in building costs based on local or temporary conditions, and while there may be occasional recessions from high levels it seems contrary to the dictates of conservative judgment to withhold any worthy or well ordered building projects in the expectation of securing pronounced price reductions. We believe in the continued growth of this country and in the steady upbuilding of our great American cities, conditions which inevitably must be accompanied by heavy responsibilities and correspondingly splendid opportunities for the building industry.

MANY people desiring to build expect to finance the operation by obtaining a mortgage at four or five per cent. That day has passed. Investors simply will not sell the use of their money for less than market price. The law of supply and demand applies to safe investments as well as to other lines of business. Mr. Straus shows that there is comparatively little reluctance to invest large sums of money in mortgage bonds where the returns are adequate and the safety of the principal assured.—Editor.

Improvement in Building Situation

THAT the building situation throughout the country is improving is indicated by the steady flow of capital now being advanced for financing new operations. An example of this is shown in the announcement of S. W. Straus & Co. that within the last few days they have underwritten first mortgage serial bond issues on apartment housing accommodations involving a total valuation of approximately $10,000,000.

With regard to the general building situation, there are signs of increasing activity in the building industry, which pertains not only to the increasing volume of operations, but also to the general tone of optimism which is apparent. We note an increased volume of inquiries for capital for building operations, and there are fewer indications of a hesitant attitude by builders. The pressure for new structures of residential type is strong in all cities, and we believe that as time develops the building industry will prove an increasing factor in absorbing unemployment and stimulating the general business conditions of the country.

Reference was made above to the $12,000,000 loan on the General Motors Corporation's new Office Building at Detroit, Michigan. This building, which has just been completed, represents an investment of more than $20,000,000. It occupies an entire block 300 x 500 feet, is fifteen stories tall and is the largest office building in the world.

This loan represents one of the largest real estate mortgages ever recorded. It was offered to the public in first mortgage 7% serial bonds maturing from 1922 to 1946.



APARTMENT HOUSE FOR TWENTY-NINE FAMILIES

"Hampton Court" at Indianapolis, Ind., Provides Separate Homes for Each Tenant

APARTMENT houses are usually built with accommodations for one or more families on a floor. In some cases "duplex" apartments have been built with the rooms arranged on two floors. "Hampton Court" carries out this idea a step further by having what is practically a separate house for each tenant but with all the service that a modern apartment house provides.

Hampton Court was built from plans prepared by Messrs. George and Mac Lucas, architects of Indianapolis, Ind. It is an excellent example of making use of a deep lot.

Hampton Court consists of twenty-nine separate individual apartments, each separated by fire walls and are absolutely private, affording the tenant a feeling of security and freedom from annoyance by other tenants in the buildings.

Each house has its own private entrance door, hall and stairway, together with the usual quota of bed chambers, baths, servants' quarters, laundry, living room, dining room, butler's pantry, kitchen and sun and sleeping porches.

In choosing the name "Hampton Court" the architects had in mind the famous Hampton Court just outside of London, built by Cardinal Woolsey and presented to King Henry VIII with court and garden effects.

The exterior of the structures are of full range variegated mat brick. The trimmings are "terra cotta" and were furnished by the Indianapolis Terra Cotta Company of Indianapolis. The buildings have slate roofs of variegated colors.

The sun parlor walls are painted in tones of gray in Tiffany blended shades, the draperies are made with a shaped valance of beautiful linen with pea fowl and old rose gray and black ground, side draperies being in gray with black silk trimmings.

The living room is in old English and draperies are in old blue velours. The reception hall is finished in a soft tan shade, draperies are of silk in mulberry shade.

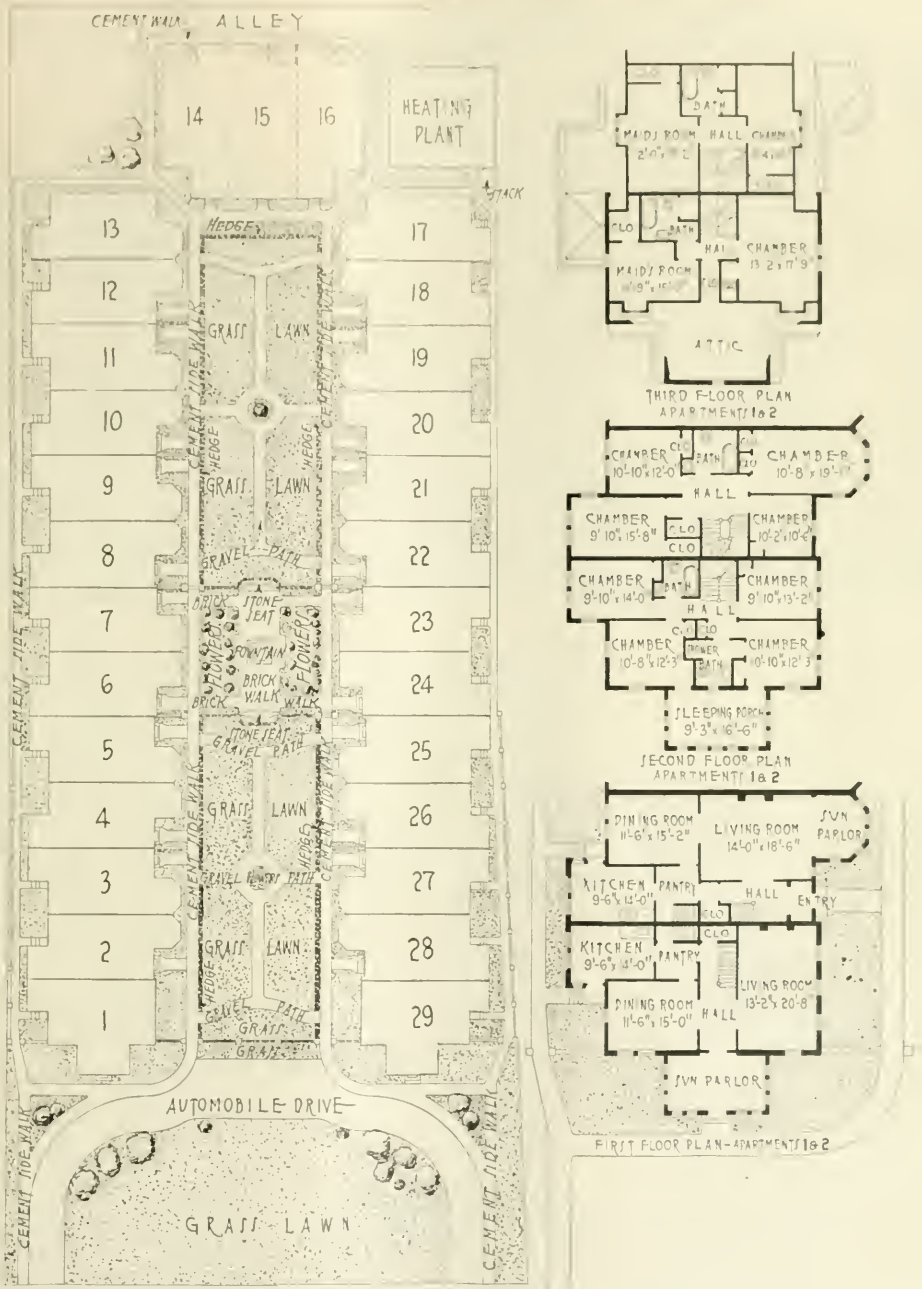
The walls of the sleeping porch are finished in gray with hangings of linen crash in the natural shades. The bed chambers are finished in gray.

The bath rooms are all finished in white enamel with tile floors and marble wainscoting. The plumbing fixtures and showers are of the very best quality.

Hampton Court has its own heating plant in a separate building; it is a two-pipe vapor job with smokeless boilers.



A Close View of One Apartment



Plot Plan of "Hampton Court"—Floor Plans of Apartments

Suggestions for Winter Work

Modern Methods of Working Provide Twelve Months' Work to the Building Year

THERE is no good reason to "lay off" in the building business for the winter months. There is plenty of work to be done and it is strictly up to the contractors and builders to impress on the people of their community that building workers do not only desire jobs from April to November, but all the year round.

One of the benefits of the war was that it impressed on everyone the fact that building construction work could go on during winter. All of us will recall the severity of the winter of 1917-1918. Shipyards, concrete work, steel work, wood construction, etc., went right along at top speed (and top cost too) because *we had to*.

In peace time we should make use of these lessons. It is certainly uneconomical for any industry to be idle for part of the time. In the present state of our country it is the duty of everyone to find or create useful employment so that all who are willing to work may have a job.

Building Repairs Needed

Contractors can impress the fact that property maintenance presents a large field where action will benefit equally both owners and the unemployed. The preservation and repair of buildings is a growing and very important line of work and builders can talk this subject so that the public will realize that the up-keep of their property is just as important as the building of a new structure.

The best part of this is that a very large portion of the repairs and improvements can be done indoors which means that the weather has nothing to do with keeping busy. Impress on the owners that a neglect of their property means a direct loss to them and an economic loss to the whole country.

If a new factory is to be built it means a good deal financially to every one in the community to have it ready and in operation as soon as possible. Just because it is winter is no reason to wait. Get the excavation dug, material on the site and even such work as concreting can be done safely if simple precautions are taken.

Concrete Work in Cold Weather

In order to place concrete successfully in cold weather, it is necessary to be prepared to use somewhat different methods than in summer months. The fundamentals of these methods are easily comprehended by an understanding of the action of concrete in hardening.

Hardening of concrete is not a process of drying out as some may suppose, but is a chemical reaction between the cement and the water used in the mixing. Two things are necessary for the proper hardening of concrete—namely, warmth and moisture.

Many methods are used for heating aggregates. A simple method is to use a length of iron pipe, an old boiler, or any metal cylinder over which the sand, broken stone, or pebbles can be piled, and in which a fire can be built. Care must be taken to heat the fine and coarse aggregates separately in order to avoid pre-mixing them in wrong proportions.

The concrete should be kept at a temperature around 60 degrees F. for at least two days and in very cold weather for four or five days.

Steam is preferred for heating aggregates and concrete rather than stoves because it gives moist heat.

Forms should not be removed until all danger of collapse has passed. Where the slightest doubt exists at least 10 square feet of the concrete should be heated with hot water or steam to determine whether it has hardened or merely frozen.

Stucco Work

With the introduction of magnesite stucco there is no reason for "leaving the stucco job until next spring;" finish the job now. Of course if the weather is too uncomfortable for working it is another phase of the question. When a workman is frozen he can of course produce but little work.



Plastering in Winter

The use of coke salamanders and the covering of all openings will enable plastering work to be done without a stop during winter—of course the watchman must be on the job to keep the fires going.

Shop Work

In the shop, work can go right along, screens can be made, garden furniture, ornamental gates, various built-in features for the home, etc. All these will keep the shop busy. It is up to the builder to suggest to the home owners that this kind of work can be done at the best price in winter time. The modern builder must educate himself to be a better salesman so as to get this kind of profitable work.

Wall Boarding

Here is a line of work that will afford plenty of winter work. There are still a large number of unfinished attics that can be finished off cheaply and well by the use of wall board. Why not make a canvass of some of the houses in your town and suggest and show how it can be done.

By the way, don't imagine that wall board is only good for walls, there are many other uses for it and the builder can obtain some profitable work by letting people know what he can do. Wall board makes excellent screens for show windows, etc.

Painting and Decorating

Why wait until spring to have interior painting and paper hanging done? Impress on your community that it can be done best now.

Painting and varnishing done now will relieve unemployment when relief is most needed, and will save the surface of valuable property.

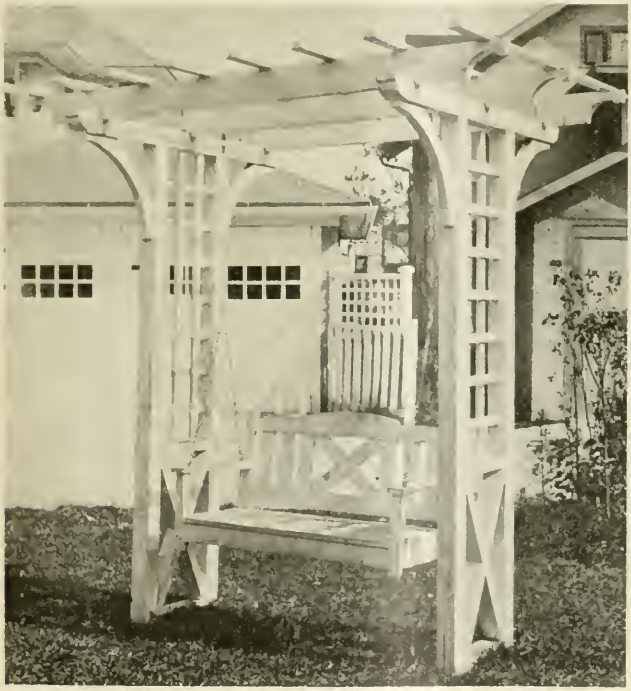
Winter Study

Don't forget that now is the best time for some careful faithful study—get some back issues of BUILDING AGE and a few good technical books. Go over the construction problems. Think about the jobs you have finished—was there a better and quicker way of doing the work? Apply this knowledge to new work: turn out better work and make more money.

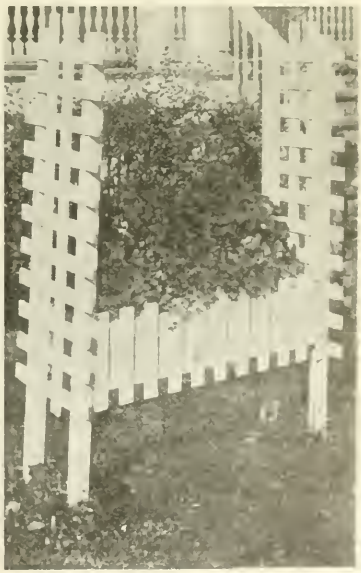
Easily Made Garden Furniture







Suggestions for Profitable Winter Work



Wiring a Home for Convenience

By G. T. HADLEY
Member, Society for Electrical Development

A RING of the door-bell, a snap of an electric switch and a cheery light beams out to welcome guests or new arrivals, for this is a home wired for comfort and convenience. No need to stumble over a dark threshold here, for the hall is prettily lighted and from it the guests get a glimpse of the living-room with the genial glow of an art lamp and softly-shaded lights in the dining-room. If you have ever entered such a house where the lighting is simple, effective and cheerful, you carried away with you an impression of good cheer and good taste. Two 3-way switches control the lights in the lower and upper halls; they save current besides being convenient.

In the living-room there is restful cosiness. Soft lighting from wall brackets and candelabra fixtures at the mantel make the room doubly attractive. The color of the silken shades harmonizes with the general color scheme of the room. Switches turn off the light of wall brackets when not needed. A wing chair has been drawn near the fire-place and here one may read by the light of a floor lamp connected with a "convenience outlet" in the baseboard.

Much too often, an architect or builder in trying to make the owner's money go as far as possible loses sight of the great convenience that an extra outlet can mean when this same outlet may be worth many times the few dollars it cost if included at the beginning of the building.

In the living-room of the home of modest type there are certain conveniences to be provided for, such as lamp for library or writing table, phonograph motor, a tea samovar, electric cleaner, electric lighting outfit for Christmas tree.

Passing into the dining-room, an electric button is pushed and the table is lighted by a modern center fixture providing a soft even illumination for the entire room, with some direct downward radiance upon the table itself. The side-board is equipped with electric candle lamps supplied with current from baseboard outlets. A similar outlet supplies the serving table containing electric chafing dish or a percolator set. In the side of the table is an outlet for the use of the hostess so that she may conveniently use table appliances, the current coming from a floor outlet. If a seamed rug is used on the floor, the cord is brought through a small slit in the seam. Two rugs in harmonious tones may be used thus leaving the space under the table free.

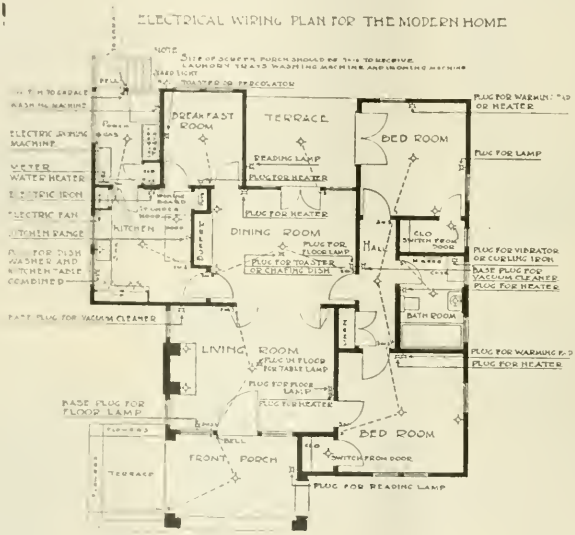
In the pantry an outlet is provided for a small motor that is useful for polishing household wares or for turning a spindle that whips or beats various mixtures, such as the making of sauces and salad dressings. A convenient outlet serves an electric dish-washer for which it is well to make provision these days. In the kitchen a special heating outlet is necessary if an electric range is to be installed; if not, it is wise to plan for the convenient use of small electric oven and electric hot plate or an electric fireless cooker which is a big labor-saver for the housekeeper.

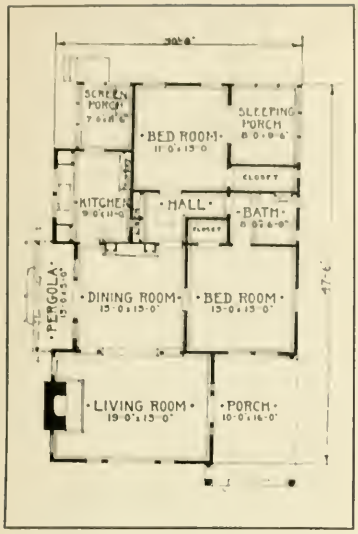
In the laundry, a special heating outlet is required for the use of the electric iron and an outlet for the electric washer and wringer. If in the course of time there may be a big ironer for flat work, it should be planned for in the beginning. A wall bracket for light on dark days, over the ironing board should be provided.

In the garage there is no outlet in center of ceiling as the house owner does not need to light the top of his car but over the work bench is a drop light that sheds light where it is wanted or most needed. One baseboard outlet supplies current for his charging outfit, while another is conveniently placed for the electric tire pumping machine. These outlets also serve for the soldering iron, repair motor or vulcanizer.

In this home of comfort and convenience the main bedroom owes much of its charm to a silk shade deeply fringed hiding a lamp and suspended over the dressing table by a silk cord. The color of shade and cord is part of the color scheme of the room and the electric switch at the door makes the light easily available.

The heat pad and the reading lamp both give comfort when desired and a duplex outlet serves both. Other baseboard outlets serve an electric heater, or a vibrator or a curling iron. Another bedroom has a duplex outlet for use of electric cleaner or lamp or fan as the case may be. The bathroom has electric lamps on both sides of the shaving mirror and there is an outlet for the use of water heater or a bottle warmer.





Bungalow Design with Two Floor Plans



THE exterior of a house may be just what a home owner likes, but the room arrangement does not exactly meet the requirements. Likewise different styles of exteriors can be used for the same floor plans.

Two different floor plans are given for the bungalow design shown on this page—the one house has more depth than the other but this does not alter the design.

The most pronounced feature of these two practical floor layouts are the large living porches which, if so desired, can be glassed in and changed to a sun parlor.

The balance of the interior is most conveniently arranged and will make an appeal to home builders as it is adaptable to any climate. The wash tubs are shown on a screen porch but this can be closed in colder sections of the country.

The exterior can be finished in clapboards, shingle, stucco, or brick as preferred, all would carry out the design so as to make a dignified, artistic home.



REMODELING *of* LARGE OFFICE BUILDING

Interesting Description of the Unusual Alteration of One of New York City's First Skyscrapers Into Modern Office Structure

ONE of the most remarkable remodeling jobs in the building line has just been completed in New York City for the office of the International Mercantile Marine Co. They were fortunate enough to purchase the old twelve-story office building known as No. 1 Broadway which is opposite the palatial Custom House and faces Battery Park and New York Bay—a very desirable location for the office of a large steamship corporation. Other rival companies have recently built office structures in the vicinity and many of these are architectural monuments and veritable palaces of commerce.

The building on the site was too good to tear down but did not compare favorably with more recent buildings hence the plan to remodel the old building into one that had every modern improvement and of such architectural design that it would compare favorably with the buildings of other steamship companies.

The remodeling was a more difficult job than putting up a new building—the first two stories had all supporting walls and columns removed to make one large room on the first floor, besides new elevators, stairs etc., on the interior—the exterior was entirely refaced. Few would recognize it as that of the old Washington Building, known for a generation as the first sky scraper of lower Manhattan whose red brick walls and slanting coppered roof and cupola were landmarks seen from far down the harbor, across the green of Battery Park.



1881 to 1920 — Substantial Construction Lasts

The transformation of the building has been more than an outward change; it has extended to the very vitals of the structure. The building in fact has been given not only a new skin, but it has been largely rebuilt as to its frame, and done over in the main arteries of entrances, staircases and elevator shafts.

Technically the work of making over the building has presented a strong testimonial to the genius of American engineering and architectural deftness. The problem presented to the the architect, Mr. Walter B. Chambers, New York, was no ordinary one. He was under the necessity of rebuilding the structure, outside and in, without dispossessing the tenants on seven floors.

The task involved by the sweeping structural alterations in the building called for many niceties of calculation and execution. The work included extensive strengthening of foundations in some places; the entire elimination of the heavy interior frame structure of the first floor, and the incorporation of the space in that floor into the upper portion of a lofty booking office; removal of roof and tower, and the construction of two new stories in their place; removal of old elevators and construction of new, in a different place; the relocating of staircases; change in the location for the main entrances to the building, and the introduction of entirely new ventilating, heating and electrical systems.

The finished product reveals a highly successful accomplishment, as the building presents today, both in its exterior and interior, a character and tone completely at variance with the old-fashioned red brick structure from which it has emerged.

Carvings, cunningly worked into the stone, suggest the uses to which the building is put. Over the arch of the main entrance in the spandrels

and pediment, are shown Neptune, God of the Ocean, and Mercury, God of trade; above is the American eagle.

The architectural and decorative mouldings and carvings around the entrances and elsewhere are also made up of nautical suggestions, like sea shells, seaweed and star fish, while in the iron work of the elevator grilles are seen anchors and ropes, steering wheels and dolphin prows.

The distinguishing feature of the interior is the great booking office, extending the entire length of the Battery Park front of the building, from Broadway to Greenwhich Street, with a length of 160 feet and a breadth of 40 feet and ceiling 25 feet high.

THE original building was erected nearly forty years ago, and a few years later two stories were added, increasing the height to 12 stories. The construction in general was good and substantial, with a very heavy iron frame. It contained a total of six slow speed elevators, and only one stairway.

The reconstructed building is 12 stories in height, with two mezzanines and two roof pent houses, one of which contains offices. All new stories and parts have metal doors and trim. There are two separate main stairways, and eight high speed electric elevators.

To obtain unobstructed floor area and height for the booking office from the two original lower stories necessitated the removal of floors and interior columns from the basement up to second floor, the floors and columns in upper stories being supported by new steel girders and columns.

Owing to unusual conditions, the work had to be carried on according to pre-determined methods and schedules to insure uninterrupted service and convenience to tenants and, above all, absolute safety.

After preliminary surveys and soundings, work was started by excavating for the construction of new piers against the outer walls, and in the interior of the building, down to solid rock, while reinforced concrete girders were placed below the basement floor. All this was for the support of new walls and interior columns (to take the place of those ultimately to be removed in the lower stories) and by means of heavy plate girders under second floor to support the old columns above.

Cutting out floors and walls in the west or Greenwich St. wing, new framing and floor construction; installation of the new elevator shafts, stairs, toilet rooms, etc., in this wing, which had to be completed and in service before any old elevators, stairs, etc., could be discontinued.

As portions of old ground, first and second stories were vacated by tenants, these were dismantled in successive stages to make room for the new construction, meanwhile all floors from third to ninth being tenanted.

The new exterior embraced a granite base up to first floor level, and light buff Indiana limestone above. The original red brick and brown stone fronts and window jambs were cut back to receive the new stone facing, starting at the bottom and continuing upward, following immediately with the new work.

The old walls and piers being bearing and self-sustaining with no steel skeleton, the work called for the greatest care and judgment. Fortunately they were of very good construction and ample thickness. Nevertheless a complete system of needling and shoring was installed, and other precautions were taken to provide for any possible contingency and eliminate risk.

Owing to the delicacy of the work and the unusual conditions, more than ordinary care and precautions were taken in absolutely secure and solid anchoring, bonding and backing of the new stone work to the old walls, thereby giving an even stronger and better construction than is usually found in ordinary new work.

While the work on the lower part was going on, the new work was also started at the ninth floor, in order to save time and permit work on the steel and masonry of the upper stories and roof to proceed. About the time the upper walls were completed the stone facing below had progressed up to and connected with the work



1922 — Emerging as a New Modern Building

started at ninth floor, practically completing the entire new front work at the end of 1920, with the exception of the set-back eleventh story, the stuccoed pent houses and the copper roof.

The column and girder installation had some interesting features. These included the taking out of ten old cast iron columns from the foundation up to the second floor, to provide for the main booking offices, and also the removal of one of the cross-bearing walls, necessitated by the provisions for supporting the upper structure by new construction.

Concrete piers against the exterior and court foundation walls were next installed and connected across the building, underneath the basement floor, by the reinforced concrete girders mentioned, designed to pass on each side of, and leave undisturbed, the interior column foundations, for which purpose two sides of the heavy granite base blocks of these latter were partly cut out.

On these piers and girders steel columns were erected against the exterior and court walls, extending up to the ceiling of the new booking office, with steel bolsters at top for support of large plate girders to carry the centre line of the old cast iron columns from the second floor up. The columns were solidly encased in the new brick lining of the exterior and court walls.

The plate girders consist of two single, one at each end, 56″ high, 38″ width of flanges and weighing about 32 tons each, and six pairs, each unit of which is 56″ high, 21″ flange width and weighing 17 tons, also several smaller girders of approximately 12 tons weight each.

The girders, forming pairs, were installed on each side of the old cast iron columns, against which, and resting on top of the girders, large steel shoes were placed at the second floor, connected and bolted through the columns with sixteen 1½″ milled and tight fitting bolts in each direction, for the purpose of transmitting the column load, through the shoes, to the plate girders.

Steel wedges placed between the shoes and top of the plate girders were carefully driven to gradually take up the load, and when finally the entire load of the old column line had been transmitted to the girders, and these had assumed their permanent deflection, the old columns below the second floor were removed. Then, as an auxiliary to the shoe connection, and as an additional safety precaution, a steel shoe or blocking was installed and wedged up between the pair of girders, below the cast iron column, giving a direct vertical support.

The hoisting of the plate girders, which was done by means of two Yale & Towne 20 ton chain blocks hung on heavy timber movable trusses, resting on the old second story floor construction, was preceded by an elaborate system of vertical and horizontal shores, braces and tie rods to support the chain block trusses and old floor construction, and prevent any lateral movement of walls, piers and old columns.

At no time during the entire operation was a line of old columns left unbraced in any direction, except when the longitudinal brace on one side was temporarily removed to allow the girder to pass when being hoisted and then steel cable ties had been installed around the column to act in its place.

As each girder was being hoisted it was followed by a timber benching or cribbage built up at each end in such a way that should anything, despite all known precautions and safeguards, slip or give way, any sudden drop of the girder would not have been greater than a few inches.

Too much credit for this remarkable undertaking cannot be given to the men whose efforts created this huge remodeling operation. As mentioned before the architect handling this interesting commission was Walter B. Chambers. He has designed or reconstructed a number of large buildings in lower New York. The general contractors were the Whitney Company of New York, and steel construction by the Norton Company. The general direction of the job was in the hands of the International Mercantile Marine Co.'s construction superintendent, William F. Gibb.

Remodeling of a Detroit Residence



The David Scott House During Alteration
Working on the Roof



Stuccoed and with New Roof It Is a New House
Warmer in Winter

Attractive Stone Church of Gothic Design

THE church design shown here is that of the Presbyterian Church at Drexel Hill, Pa. This interesting structure was recently completed from plans prepared by Messrs. Heacock & Hokanson, Architects, of Philadelphia, and the general contractors were The Bowden Construction Co., of Philadelphia.

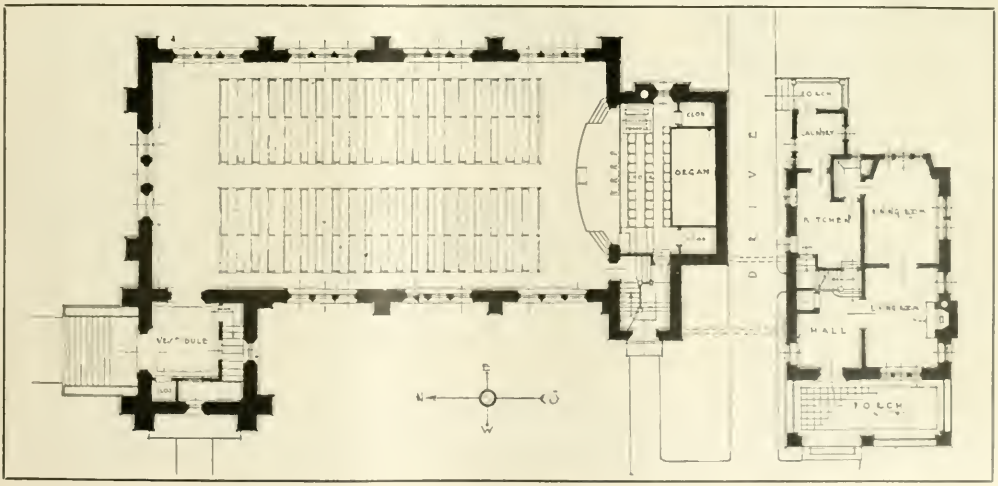
The walls of the church are constructed of native stone laid up in broken ashlar with trimmings of dressed limestone.

The architecture of the church is along Gothic lines; the principal features being the buttressed belfry at the corner and the Gothic mullion window of the front. This window has an unusual treatment in that the two mullions are quite wide, allowing the native stone to be used between the carved sides of each mullion.

The size of the nave or auditorium is 38 by 76 feet inside, exclusive of chancel and choir space. The pews are arranged as shown on the plan. The roof is carried by three trusses, supported by buttresses on both walls, the front and rear walls being carried up to support the purlins.

A parsonage or "manse" has been built at the rear of this church, the front facing the side street. It is built of native stone the same as the church and harmonizes with its architecture. The arrangement of the rooms of the first floor are shown below with the plan of the church.





Importance of Bracing During Construction

Simple Precautions to be Observed to Prevent Accidents

By OWEN B. MAGINNIS

ALTHOUGH nearly all qualified builders exercise care and precaution in the various operations included in construction, there are some vital details which are oftentimes either overlooked or omitted; and among these is the matter of bracing during construction.

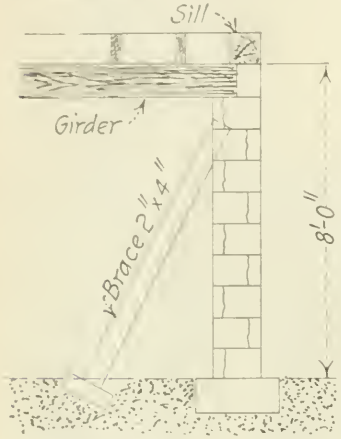


Fig. 1—How a Stone or Concrete Foundation Wall Should be Temporarily Braced

This important detail is most paramount in the erection of columns, posts, piers, frame, brick, stone, concrete walls, roofs, etc. In the sectional sketch Fig. 1, represents the proper way by which every new foundation wall should be temporarily supported and maintained until the mortar joints have hardened and set, and the structure has become sound and stable. It consists of a number of 2" x 4" spruce or hemlock joists placed and spaced about six feet apart to serve as raking shores or spur braces to preserve and keep each wall straight plumb and secure while the girders and floor beams are being set or placed in position.

Fig. 2 indicates how the same method is applied to isolated cellar piers which support the cellar girders. They should be placed at all four faces and it is the better practice to make a band of wood around each, to which each sloping brace is nailed, for it must be remembered that the slightest jarring or shock to brick,

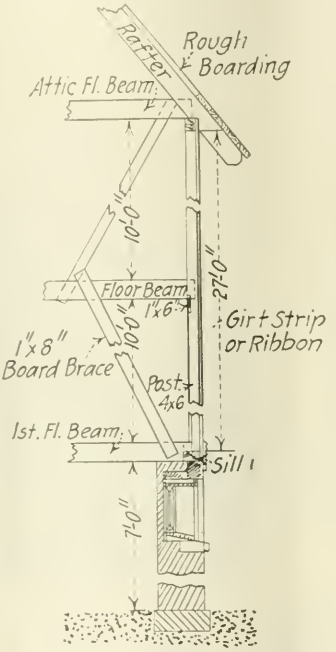


Fig. 3—How Temporary Interior Sheathing Board Braces Should be Nailed to Floor Beams as Each Tier is Placed

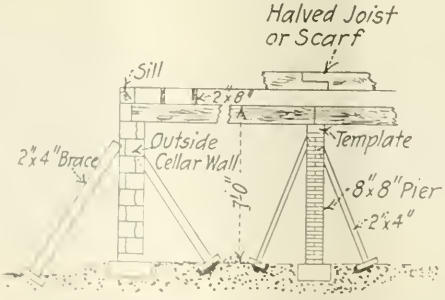


Fig. 2—How Foundations, Piers and Walls Ought to be Temporarily Braced While Green or Until the Mortar Has Set

concrete block, or masonry walls and piers will break the bonds and render the structure unfit or unsafe.

Coming now to the frame superstructure we note that in the cross section of a frame wall, Fig. 3, each and every tier of floor beams must be braced. I say must, advisably because the introduction of these in-

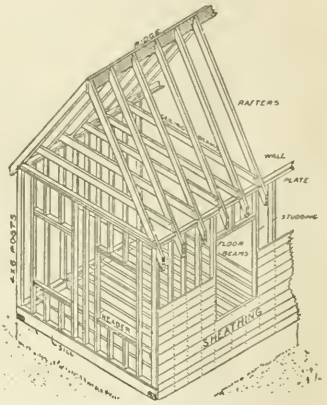


Fig. 4—Bungalow Frame Which Lacks Required Bracing

dispensable safety measures is absolutely necessary and their omission is likely to cause failure and promote disaster or injury.

Every builder and foreman should keep in mind the fact that in a moderate wind there is a pressure of from 20 to 30 pounds per square foot acting on the structure. The vertical details, being outside of their own gravity, subjected to this force must yield, that is, fall and overturn if not temporarily supported by such excellent resisting agents as the braces here placed and nailed. They should be inserted at every sixth or eighth beam and reversed at each story in the manner indicated in Fig. 3 and again should the house be wide they can be crossed so as to form, as it were, an X, Fig. 5, thus resisting in both directions. There is nothing more dangerous in raising the frames

of timber houses than this lateral movement and its only preventive is diagonal bracing.

All braces should have a slope of not less than 60 degrees and be of good sound unbreakable boards or joists well nailed so as to be safe and reliable. During the past summer many new frame houses were pushed over out of plumb and strained through lack of sufficient bracing, which was caused by the heavy gales

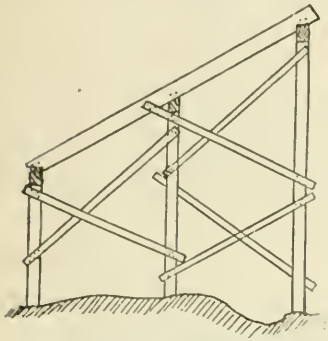


Fig. 6—How Reviewing Stands, Advertising Signs and Such Like May Be Safely Braced

and squalls which invariably accompany thunderstorms, cloud-bursts and the like. Again the strain and vibration of mechanics working on the posts, floor beams, etc., is always going on so that bracing, unless it is in itself inherent in and a constituent part of each wall and partition, must be used.

In the frame of a little bungalow shown in Fig. 4, we note the lack of bracing which might be done in the criss-cross fashion shown in Fig. 5, but this defect can easily be remedied by nailing on the sheathing diagonally or from corner to corner instead of horizontally as shown. Again the rafters ought to have at least some collar beams as in Fig. 5. Still further, such a frame as this could be made very stable by sloping studs at the corner posts.

For all such structures as Platforms or Band Stands permanent or temporary, Reviewing Stands, Advertising Signs, or others exposed to

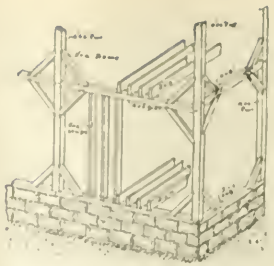


Fig. 8 Braced Angles or Corners, so as to Give Clear Passageway

stram, pressure or weight, "diagonal" bracing is the most adaptable and essential as represented in Fig. 6, and 7 two sketches which are self explanatory.

Let the lesson of the fallen building impress builders and mechanics on the job to the need of proper support and bracing during building construction. An ordinary wind storm is no excuse for a blown down framework, wall, etc.

The principle of all good bracing is that the shape of a triangle cannot be altered by any pressure applied at its corners. A rectangle, however, will be altered to a rhomboid by any pressure applied at its corners.

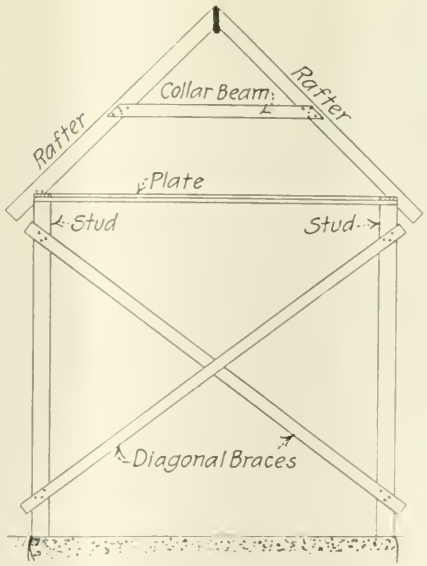


Fig. 5—Temporary Diagonal Inserted to Prevent Movement Before Sheathing and Inside Partitions Are Set

This can be easily proved experimentally and will be more instructive. Make a rectangular frame of thin lumber and fasten the corners with one nail only and make a similar one of triangular shape. Now apply pressure to each—the rectangle will collapse while the triangle will not, unless the material itself breaks.

If a few nails are applied to the corners it will take more pressure to make the frame collapse. Staggered nailing makes small diagonal braces.

Diagonal braces make triangles and that is why they are so effective. Look

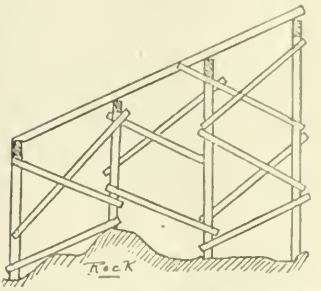


Fig. 7—Another Example of Safe Bracing for a Reviewing Stand

at any large bridge or roof—it is usually of lattice construction because it will safely support the load with the least amount of structural material.

For sheds and side walks in towns and cities we must brace the upper angles by the method given in Fig. 8, although the mortise and tenon can be adequately replaced by heavy plank braces spiked to the cross beams. All heavy posts, columns, piers, etc., must be braced after being set up plumb, and in proper position to preserve their equilibrium balance and so on, with each and every vertical detail in building construction and engineering works.

The above is written to draw attention to, and impress upon those practical readers the importance of this part of building procedure in order that the work may go on rapidly and successfully, with safety and free from possible danger to life or limb and to a completion of permanent security and satisfaction.

COLLAPSE *of* THEATRE DURING CONSTRUCTION

Lack of Proper Knowledge and Precaution Leads to Disaster. Impressive Object Lesson on the Value of Intelligent Supervision and Good Construction

WHEN a building collapses during its construction it is quite evident that there is something materially wrong with the methods used in its construction. It seems inconceivable that a large structure, the plans of which were prepared by a well-known theatre architect, passed by one of the most rigid building departments, and erected under the constant supervision of experienced building inspectors, should develop such weakness as to collapse before it is finished.

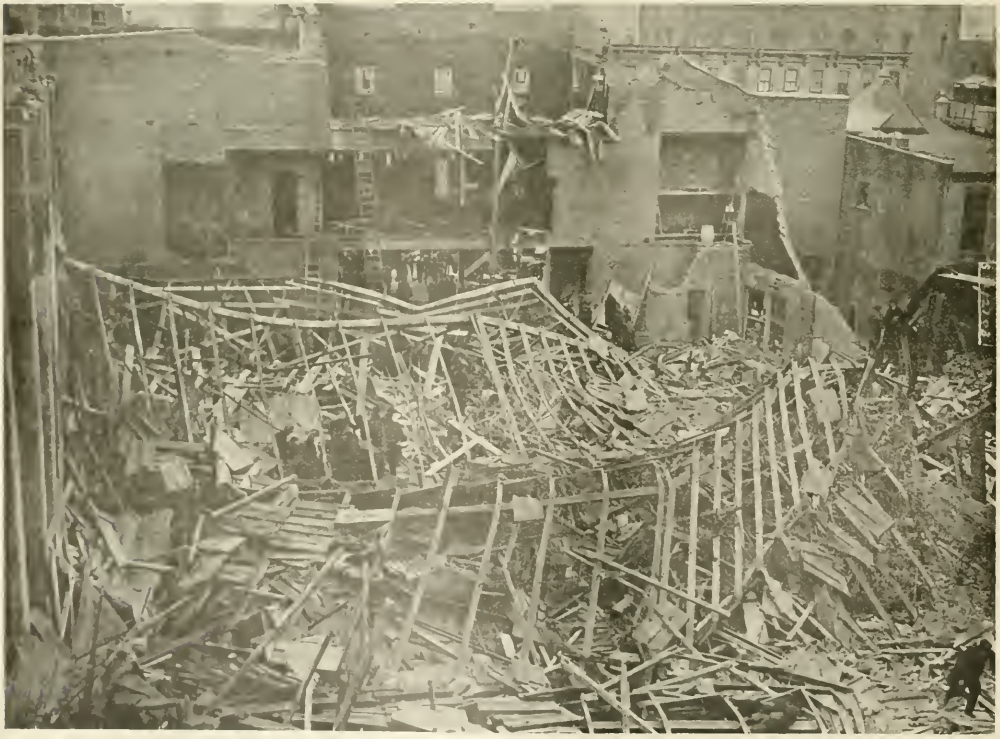
And this is just what happened in the most unfortunate collapse of the new American Theatre, which was nearing completion, on Bedford avenue, Brooklyn Borough, of New York City. This theatre was to have a seating capacity of 1800 people. The work had progressed to the lathing. It was of course to be a fireproof structure and the metal lathers were at work on the interior scaffolding, putting up the ceiling which was hung from the trusses.

The collapse occurred at a little after 1 P. M. on Tuesday, November 29th. It came practically without warning and the unfortunate workmen were trapped in the tangled mass of scaffolding, steel work and brick.

Our photographer reached the scene of disaster a few hours after the collapse, and while the firemen were still at work trying to rescue some of the victims. Seven workmen, including one of the sub-contractors, were killed, and at least twenty others received more or less serious injuries, while many had almost miraculous escapes. There were about fifty men at work in the building when the collapse occurred.

One of the fortunate ones told the writer how he and a fellow workman escaped to the street amid the falling bricks and steel work; his young buddy was so frightened after escaping with his life, that he kept running and a passing automobile knocked him down and ran over him, breaking one leg.

Bad as the collapse was, it is really Providential that it occurred when it did and not a few months later when



The Awful Results of the Collapse — Rescuers at Work

Photo by Underwood & Underwood

it would have been open for business. Look at the pictures in this article and consider the awful possibilities of a collapse of this sort with the house crowded to capacity! DON'T do shoddy work—think what may happen!

There is an important lesson here that should be impressed on every one in the building business. There is more to building than just merely getting the job through. A structure must be safe enough to be used for the purpose it was intended for, and proper precautions should be taken for safety during construction.

One must remember that until a structure is completed in its entirety, there are certain parts that do not obtain their full strength until complete. Anyone who has studied mechanics knows that sometimes a structure only half complete is very weak compared to the strength which it will have when all members are installed; this is especially true of any frame work.

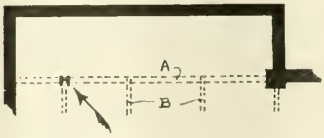
We are all familiar with an arch: all know that it cannot be built without a form to hold the voussoirs in place, but as soon as the keystone is in place, completing the structure, we have something that has an immense amount of strength. Remove any part of the arch and a collapse is certain.

In an article in this issue, Mr. Owen B. MacGinnis writes about the necessity and importance of using bracing during the construction of a building. One must remember that masonry does not acquire its full strength for some time after it is set in place. Frame work sways until braced.



View Showing Fallen Trusses

Photo by Underwood & Underwood



Arrow Points to Column that Moved—
(A) The Truss Supported by Column—
(B) The Trusses Supported on Truss A

During construction there is also a certain amount of vibration of the entire structure due to hammering, etc. Every student of mechanics has had impressed upon him the danger of rhythmatic vibrations; all are familiar with the old precaution of making soldiers break step when they are crossing a bridge.

There have been many varied reports, even from some of the workmen employed on the job, that poor material was used, dirt for cement, etc. These rumors had no foundation in fact. As far as we have been able to learn, no really one definite fault has as yet been found for this collapse. The brick walls themselves did not fall but were carried down when the roof trusses fell.

A built up steel column about 30 feet high of H shape supported one end of a main truss, the other end resting on the wall which was properly buttressed as our picture clearly shows. This column "slipped" off its footing, carrying down the roof, etc. It seems that this column was not securely fastened to its base, which



Street View of Theatre at Time of Accident

allowed a certain movement to take place, and which became worse with each little vibration, finally shearing and pulling off the foundation bolts, and then slipping inwards, carrying down the roof, etc.

Careful examination of the pictures will reveal that the walls are intact—there was no slippage of the foundation due to shifting of the earth. The column itself did not collapse, it being in particularly perfect condition; there was no crushing, it was strong enough, but evidently was not properly braced to prevent lateral motion.

One can easily comprehend the immense strain on a foundation bolt when the leverage of a column 30 feet high is working against its resistance.

Many serious building accidents have happened in the past, and each one teaches its lesson. We also all know about the Quebec bridge disaster which occurred some years ago. Builders must always be on the lookout against strains arising in incomplete structures.

Large work can be carried on without any collapse; thousands of successful examples are everywhere about us. It is however dangerous business for inexperienced builders to go about erecting structures having wide spans and height without knowing just exactly *what* they are doing and *why* they are doing it.

The plans of this theatre were designed by Mr. C. A. Sandblom, of New York, who has designed many successful theatres. He drew the plans of this American Theatre and gave a schedule and details of the steel work, etc., *but* he was not employed to supervise the construction. The plans were turned over to the owners, who were also the contractors, and "some one" suggested making a change in the steel work, and a revised set of structural plans were made and these were the ones used in the erection. Messrs. Sylvester Rosenthal and Samuel Moskowitz were the owners and contractors, and both were arrested and are now awaiting trial for manslaughter.

Builders should realize that forms, centers and braces are necessary for safe construction. Haste has been blamed for most of the failures in the building line, still many large buildings have been erected in record time with complete safety to the structure, the mechanics, and public.

It is all in knowing how to do it and observing proper precautions. The small contractor and builder can learn a lot by observing the methods of the large construction companies. Observe how they erect staging, scaffolding, guards for the public, etc. They have found out that it pays big to always remember about safety during construction both for the structure and men.

Inspiring Workmen to Do Their Best

HERE is a story of a large construction job being tied up on account of a strike and how the work was carried along by eliminating the work of the strikers. Laborers who worked with a will overcame the handicaps of doing without machinery.

The job is one of the biggest construction jobs in Chicago, a structure 800 feet long being built for use as the United States Mail Terminal. It is being erected under the direction of J. D'Esposito, chief engineer of the Chicago Union Station Company. It is located east of Canal street, on the south branch of the river, between Van Buren and Harison streets. The R. C. Wieboldt Company, of Chicago, the general contractors, had to dig 142 caissons to hard pan, a distance of fifty-five feet.

How Prizes Helped to Get Work Done on Time

Vice-President A. F. Klein of the Wieboldt Company, tells how he put such pep into the digging by establishing contests with cash prizes of $200 and two gold watches, that every one on the job followed the race with the interest of a championship football game.

"The job was tied up on account of dissatisfaction of the hoisting engineers with the Landis wage ruling," said Mr. Klein. "The caisson diggers were told that if they'd show the proper results these foundations would be 'pulled' by hand instead of with an engine. The results were so satisfactory that the rest of the caissons, thirty, were done by hand even after the engineers had returned.

Rewards for Capable Men

"With the idea of rewarding the work of the particularly capable men and in the spirit of sport, prizes were put up. First the preliminary trial heats were held and from these the four best caisson diggers were selected for the finals.

"On the morning of the start of the race the enthusiasm had reached such a pitch that the men insisted on being right in the caissons when the 8 o'clock whistle blew. Bets were placed as to the probable winners and the entire job organization promptly took sides with the four gangs in the race. No hundred yard dash could have been any closer, so nearly matched were the contestants.

"When the whistle blew at 5 and the engineer and superintendent measured the results with a steel tape the closeness of the race may be seen by the following depth records:

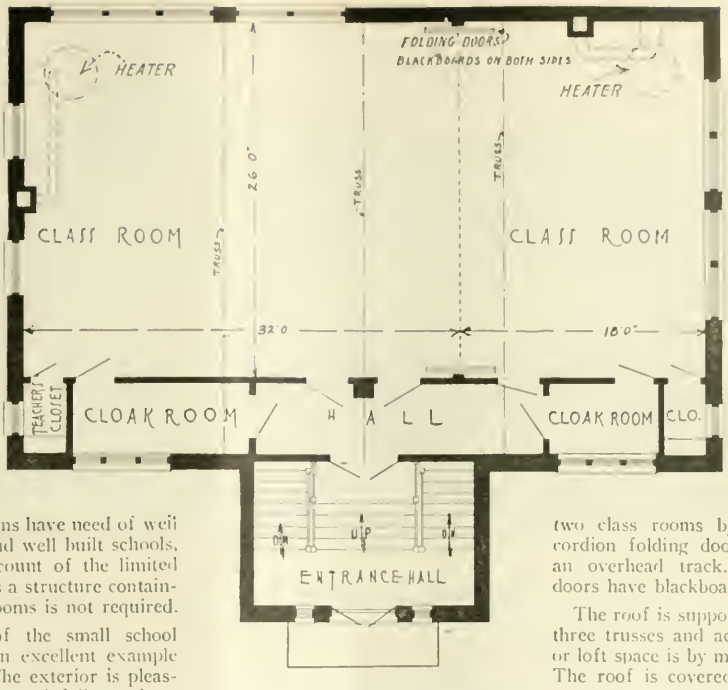
Michael J. Naughton	27 ft. 10 in.
Tom Caufield	27 ft. 9 in.
M. Horan	27 ft. 6 in.
J. Reardon	27 ft. 6 in.

"All of these were in a four foot diameter caisson which was lagged, ringed, dug, and hoisted by hand. It was necessary for a man to dig and load into buckets some twenty tons of stiff blue clay in eight hours, besides lagging and bracing the caisson. The ordinary or average depth attained in caissons of this size in eight hours is from six to thirteen feet. The gold watch and prize money were awarded to Naughton, known to the fellow workmen as 'the submarine.'

The prizes were awarded before an audience made up of the entire working and engineering organizations of the job. In my nineteen years' experience in the building business I know of no record approaching this."

All of which shows what can be done toward establishing a more friendly basis between employer and worker and getting more work done. Why isn't it tried oftener?

Neat and Tasteful in Design and Well Planned



A Brick Structure Filling All Requirements

A Country School

of Colonial Architecture

SMALL towns have need of well planned and well built schools, but on account of the limited number of pupils a structure containing many classrooms is not required.

The design of the small school shown here is an excellent example for a village. The exterior is pleasing in appearance and follows along Colonial lines in its architecture.

The entire building is constructed of brick and is heated by two furnaces located in the basement, which has a cemented floor and is used as a playroom.

The interior is practically one large assembly room which is divided into two class rooms by means of accordion folding doors supported on an overhead track. These folding doors have blackboards on each side.

The roof is supported by means of three trusses and access to the attic or loft space is by means of a scuttle. The roof is covered with slate.

This school was erected at Southampton, Pa., from plans prepared by Mr. Harry Parker—architect of Philadelphia, and the contractor of the was Mr. John Ramsey, Ivyland, Pa.

Besides its use for school purposes the village school is the general meeting room for any civic gatherings of the community.





Modern Barns Made Attractive

MODERN barns are being made more sanitary in their interior construction and particular attention is being paid to ventilation. The exterior design of barns should not be neglected. It only takes a little extra thought to produce a pleasing design so that the barn will not be a blot on a beautiful landscape.

The building shown above is the concrete dairy barn at Arden Farms, St. Paul, Minn. J. M. Hawkins is the owner. Below is shown an interior view of the dairy barn on the Albert French Estate, Lebanon, Ohio. Here the cows face in, which makes feeding easy, some prefer the cows to face out for ease of cleaning. It is a matter of opinion just which is the best method to use; it depends a lot on whether the manure spreader is to be driven right in the barn or an outside pit is used.



How to Develop Hopper Bevels

RICHARD M. VAN GAASBEEK

School of Science and Technology, Pratt Institute, Brooklyn, N. Y.

A HOPPER is a trough usually shaped like an inverted cone, the sides of which splay out from the bottom. Splayed work as it is termed in joinery denotes a surface sloping away from or toward other surfaces. Such work is often found in jambs, sills, sides of windows or doors, hoods over fireplaces, etc. A hip roof is nothing more than an inverted hopper requiring a knowledge of hopper bevels to properly intersect the roof boards on a hip rafter and for laying out the side and top cuts for gutters intersecting on hip roofs.

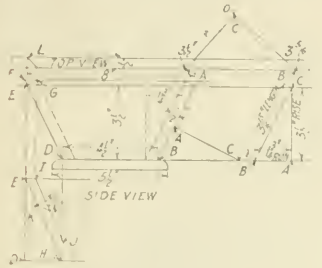


Fig. 2—Method for determining a miter joint for a hopper

Figure 1 shows 2 boxes, the sides of which splay out from the bottom. The sides of the box on the left are mitered at the corners. The sides of the box on the right are butted together at the corners. If you can make these, the boarding of roofs, etc., will be easy for you.

MITER JOINT.—To develop bevel for joint on square edge of the stock, draw at least one side of the hopper as shown at the left, Fig. 2, full height and laying off the exact thickness of the stock to be used in the construction of the hopper. *D-F* (4 3/16″) is the width of stock required for a side. *E-F* is the corner to be removed in producing a level line for the finished top edge. A convenient distance above the side view, draw two lines a distance apart equal to the thickness of the stock to be used, on which the miter bevel on top is to be developed.

Project a line up from the point *F* and also from *G* until it intersects the top view as shown on the left hand side, Fig. 2, and connect the two points thus obtained for the intersecting miter cut. The miter cut can also be laid out with the steel square as shown on the right hand side, Fig. 2, by using the rise *A-C* (3¼″) on the tongue and the length (3 15/16″) (bridge measure of the run and rise) on the blade, mark on the tongue for the miter cut.

To lay out the side of the hopper use the run *A-B* (1¾″) on the tongue and the rise *A-C* (3½″) on the blade, mark on the tongue for the splay of the side. Measure on the line *E* in laying off the length of the side (8″). Cut four sides exactly the same length and remove the corner *E-F* before fastening together.

If a bevel square is set to the miter developed on the top edge and used in testing the joint while dressing for a perfect fit, it will mean that the stock of the bevel must be held at all times parallel to the top edge of the stock. This is rather difficult to do and the trouble can be overcome by developing the miter bevel as shown at the bottom left side, Fig. 2.

The bevel square if set to the developed angle can be applied at right angles to the miter joint and tested in the same manner that a try-square is applied in testing a square edge on a piece of stock. Drop the line *E*, on the side view down an indefinite length. Draw the horizontal line *E* on the development a convenient distance below the side elevation. Measure the distance *E-D* on the side view and make the distance *E-D* on the development the same and draw in the base line as at *D*. Carry the point *D* on the side view down until it intersects the base line as at *H*. Connect *E* and *H* giving the corresponding splay for the hopper. Carry the point *G* on the side view down until it intersects the top line *E* as at *I* and from this point produce a line parallel to *E-H* as *I-J*. At right angles to these lines draw in two parallel lines, a distance apart equal to the thickness of stock to be used in constructing the hopper and connect the points thus obtained and shown in the development, bottom, left hand side, Fig. 2. Then angle L on the top view is the miter cut laid off on the top square edge of the stock and angle *K* is the angle to set the bevel square for testing the bevel while dressing the joint for a perfect fit, holding the bevel square at right angles to the edge being jointed.

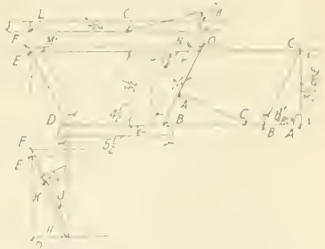


Fig. 3—Method for determining a butt joint for a hopper

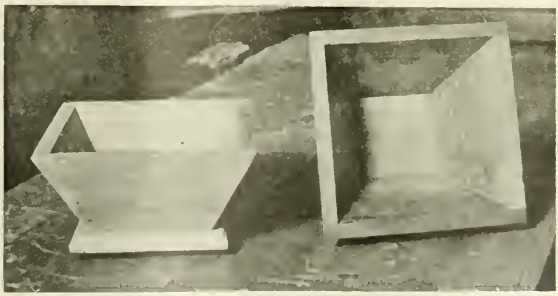


Fig. 1—Assembled hoppers, the one on the left showing a miter joint and the one on the right a butt joint

BUTT JOINT.—To develop the bevel for a butt jonit on the square edge of the stock, draw at least one side of the hopper as shown at the left, Fig. 3, full height and laying off the exact thickness of the stock to be used in the construction of the hopper. *D-F* (4 3/16″) is the width of stock required

tor a side *E-F* is the corner to be removed in producing a level line for the finished top edge. A convenient distance above the side view, draw two lines a distance apart equal to the thickness of the stock to be used, on which the butt joint on the top edge is to be developed. Project a line up from the point *F* and also from *E* until it intersects the top view as shown on the left hand side, Fig. 3, and connect the two points obtaining the intersecting butt joint.

The butt joint can also be laid out with the steel square as shown on the right hand side, Fig. 3, by using one-half the run *A-B* (1¾″) or ⅞″ on the tongue and the rise *A-C* (3½″) on the blade, mark on the tongue for the butt joint. To lay out the side of the hopper use the run *A-B* (1¾″) on the torgue and the rise *A-C* (3½″) on the blade, mark on the tongue for the splay of the hopper. Measure on the line *E* in laying off the length of two sides (8″). The two ends should be cut twice the distance *E-M* shorter than the sides, the exact length being *M-N*. Remove the corner *E-F* before fastening together.

If a bevel square is set to the butt joint developed on the top edge and used in testing the joint while dressing tor a perfect fit, it will mean that the stock of the bevel must be held at all times parallel to the top edge of the stock. This is rather difficult to do and the trouble can be overcome by developing the butt joint as shown at the bottom left hand side, Fig. 3.

The bevel square if set to the developed angle can be applied at right angles to the butt joint and tested in the same manner that a try-square is applied in testing a square edge on a piece of stock. Drop the line *E* on the side view down an indefinite length. Draw the horizontal line *F* on the development, a convenient distance below the side view

Measure the distance *F-E* and *E-D* on the side view and make the distances *E-F* and *E-D* on the development the same and draw in horizontal lines at each point. Carry the point *D* on the side view down until it intersects the base line as at *H*. Connect *E-H* giving the corresponding splay of the hopper. From the point *F* produce a line parallel to *E-H* as *I-J*. At right angles to these lines draw in two parallel lines, a distance apart equal to the thickness of the stock to be used in constructing the hopper and connect the point thus obtained and shown in the development, bottom, left hand side, Fig. 3.

The angle *L* on the top view is the butt joint laid out on the top square edge of the stock and angle *K* is the angle to set the bevel square for testing the butt joint while dressing for a perfect fit, holding the bevel at right angles to the edge being jointed. Fig. 1 shows a photo of the assembled hoppers.

Store Typifies Old Dutch Windmill

A MERE casual glance perhaps wouldn't lead you to suspect it, but the unique structure shown in the accompanying illustration is a specially designed branch store, just completed, of a large retail bakery concern, in Los Angeles, Cal. It is located in a semi-residential section of the city, and, while outwardly styled to typify an old Dutch windwill, it provides a quite commodious little shop, equipped with counters, showcases and the other usual store facilities.

The structure, it will be observed, effectively simulates the old windmills of Holland, as commonly pictured to us, to the minutest of detail. Not only is this true in respect to general lines, but it is especially emphasized in the great four-winged wind propellers, as well as also even in the haphazard-like laying of the shingles of the dome-like roof. Directly on the front is a sort of porch or awning-covered terrace, and the entrance is placed on a front corner to the left. Dutch blue, in a light and dark shade, is also employed for the exterior color scheme.



The company, which maintains a number of branch retail stores of the ordinary style in the business section, intends to establish several outlying branches of this windmill type, in various parts of the city, of which this is the first. It utilizes the Dutch windmill as a sort of trade mark, and hence the style of the branches is for the purpose of bringing the emblem into greater prominence. The uniqueness of the shop also is accounted of considerable advertising value in that they are sure to attract attention.

The designers are Harry G. Oliver and Ray Smith, architects, of Culver City, California, and the owners Van de Kamp's Holland Dutch Bakers, of Los Angeles.

ETHICS—The science of right conduct and character; the science which treats of the nature and grounds of moral obligation and of the rules which ought to determine conduct in accordance with this obligation; the doctrine of man's duty in respect to himself and the rights of others.

—*Century Dictionary.*

A Code of Ethics for the Building Industry

A Progressive Movement Tending to Raise the Standards of Practice in the Building Field

THE Congress of the Building Industry of the City of New York seeks a high standard of conduct and character among its members, in respect to themselves and the public whom they serve. As a safe-guard of the important financial, technical, æsthetic and industrial interests entrusted to its members, it offers the following exposition relative to ethical practice; and urges upon its members and the public compliance of the principles laid down.

The Building Industry, broadly considered, includes the Owner, the Real Estate Broker, the Banker, the Loan Broker, the Architect, the Engineer, the Contractor and Sub-contractor, the Material Manufacturer and Dealer, and Labor. Among certain of these groups professional codes of ethics have long been in use, but the Congress believes that there is need for the development of a general code that will define fair dealings for all. No set of rules can be formulated which will particularize all the duties of all branches of the industry in their relation to the public and to each other. The following principles should, however, govern and serve as a guide. All ethical rules may be comprehended within the Golden Rule.

ARTICLE I

General

It is unethical for anyone engaged in the building industry or any of its branches:

Sec. 1. To unduly or improperly increase the cost of the work or to produce work or workmanship inferior to that contracted for.

Sec. 2. To falsely or maliciously injure the reputation or business of another.

Sec. 3. To offer or accept commissions intended to influence sales or contracts.

Sec. 4. To endeavor to circumvent the fair and reasonable enforcement of building ordinances and safety and sanitary codes.

Sec. 5. To resort to or countenance "Shopping."

ARTICLE II

The Owner

Sec. 1. To endeavor to improperly influence the Architect's or Engineer's decisions as to contract obligations.

Sec. 2. To call for unnecessary or full estimates on tentative projects, or from unacceptable bidders or to withhold proper facilities from those estimating.

Sec. 3. To refuse credit data and statement as to reality of the project.

Sec. 4. To deal directly with the Contractor where an Engineer or Architect has been employed for full services including supervision.

ARTICLE III

The Banker

Sec. 1. To fail to give due weight to the Community value of improvements for which loans are desired.

Sec. 2. To fail to acquaint the borrower with all conditions (especially as to approval of materials and construction) under which the loan is made.

Sec. 3. To overload building costs with fees, commissions or bonuses not legitimately earned.

ARTICLE IV

The Real Estate Broker

Sec. 1. To misrepresent conditions or conceal any facts having an important bearing upon the real value of a property.

Sec. 2. To advise a type of development opposed to the community interest.

ARTICLE V

The Architect and Engineer

Sec. 1. To act in any other than a judicial capacity in determining contract obligations; or to fail to require full performance equally by Owner and Contractor.

Sec. 2. To require a Contractor to perform for him any part of the service which is generally recognized as the Architect's work.

Sec. 3. To cover possible oversights or errors by indefinite clauses in contract or specifications.

Sec. 4. To withhold certificates for payment when properly due under a contract.

Sec. 5. To engage in the building trades.

ARTICLE VI

The Contractor

Sec. 1. To give, knowingly, work or workmanship inferior to that contracted for.

Sec. 2. To endeavor to supplant the Architect or Engineer with the Owner.

Sec. 3. To submit to the Owner directly, without the Architect's approval and knowledge, any proposals or estimates.

Sec. 4. To fail to recognize his moral obligation to sub-contractors whose bids he has used in making his own proposal.

Sec. 6. To knowingly or carelessly under-estimate the value or time of completion of any work.

Sec. 7. To withhold payment to sub-contractors and dealers for work or for materials for which he has received payment.

ARTICLE VII

Sub-Contractors and Material Dealers

Sec. 1. To knowingly mislead, through trade customs or terms, as to the real cost or quality of work or materials, and to mislead as to the time of completion of work or delivery of materials at times that cannot be fulfilled.

ARTICLE VIII

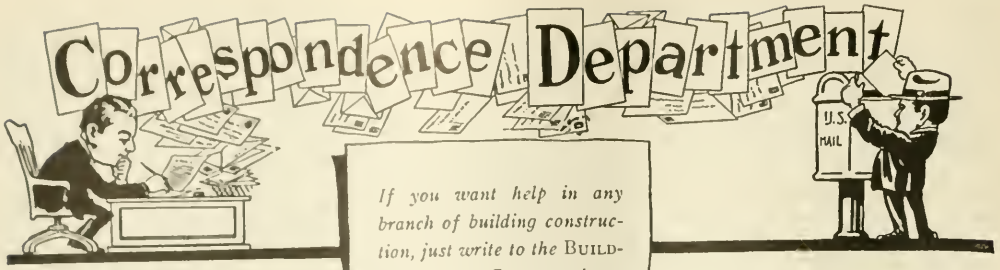
Labor

Sec. 1. To restrict the quantity or quality of the output of the individual.

Sec. 2. To increase cost through arbitrary rules as to number of workmen employed or use of plant and equipment.

Sec. 3. To deny to any man the opportunity to learn, and when qualified, to practice a trade.

Sec. 4. To abandon the work pending the decision of disputes between trades.



If you want help in any branch of building construction, just write to the BUILDING AGE *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Short Cut in Putting Down Base

MARK the position of all studs on the rough floor with a lumberman's crayon before plastering and you will find it a big time saver when putting down base, saying nothing about keeping you in good humor. There is no hammering or measuring for studs—you know exactly where they are.—**C. W. Conlee.**

How to Build a Rustic Bridge

HERE is a little snap shot of a simple bridge. Two 2x10 inch yellow pine joists form the principal supports. They are 14 feet long, the clear span



across the brook is 8 feet. The floor is of 2x6 inch joists, laid flat; they are 4 feet wide, laid 1-2 inch apart; the supporting joists are 3 feet apart at their outer edges. The rails are of rustic work as shown. The yellow pine was stained with brown shingle stain. The result was an artistic and substantial little bridge that cost but a small sum. —**Peter Older.**

Cement Washing Sides of Hole When Digging

IT is extremely exasperating when digging in sandy soil to have to dig out so much more earth than would be necessary, if the soil was more solid. Several years ago the writer was attending college in Wisconsin. The dollars and half dollars which one could earn doing odd jobs were not to be passed up, by any means. It came about that a local concrete contractor had an opening for one with a strong back and an undersized bank account to dig pits for the installation of septic tanks. We took the job.

One job, was, to all outward appearances, a pipe. The holes were dug at so much per hole and the condition of the ground made quite a factor in the matter of whether a good wage was or was not, made per hour. This particular job was in sandy soil. It dug easy. The first four feet went down quickly and we felt that we were going to make a clean up, perhaps a dollar an hour. Then the trouble started. The first cave-in didn't amount to much, but they kept coming and by the time the hole had reached a depth of ten feet its shape resembled, roughly, the mouth of a funnel. By the time that the pit had been sunk the required thirteen feet, something like twice the usual amount of earth had been thrown out.

Some weeks later another hole was to be dug in soil still sandier. It was discouraging, but a happy thought saved the day and some eight hours' work. Before the first cave-in a cement wash was mixed up in a bucket to the consistency of thin cream and this spread on the sides of the hole. Of course the sides were tapered slightly. The wash soon "set" and prevented the first handful of earth to drop which would lead to larger cave-ins. This idea has been used by the writer several times since with good results.—**Dale Van Horn.**

HAVE you ever used any machinery or device which has saved you time and money? Have you ever invented any way of doing a piece of work quicker?

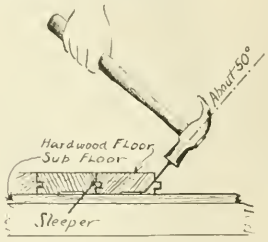
If you have BUILDING AGE wants your experience, and will pay regular space rate for it.

Your description should tell just how you saved time and money, either by a special way of using machinery or by short cuts in construction. Point out what methods you were using before adopting your "Time Saver" and show how your new method turns the trick. You can submit as many articles as you want.

Address The Editor, BUILDING AGE, 920 Broadway, New York City.

Laying a Hardwood Floor

MANY a carpenter is awkward in laying a thin hardwood floor. The most trouble is in getting the brads at the correct angle. The illustration shows clearly how this should be done.



If you lay the hardwood floor over an old one be sure to rabbitt the threshold if the adjoining room is not to have the new floor.

Should a sliver occur this can be nailed in place by a pin, as this is almost invisible. To drive the pin in without bending grease the point and then tap it lightly, but steadily, and in she goes.—**Godfrey Peterson.**

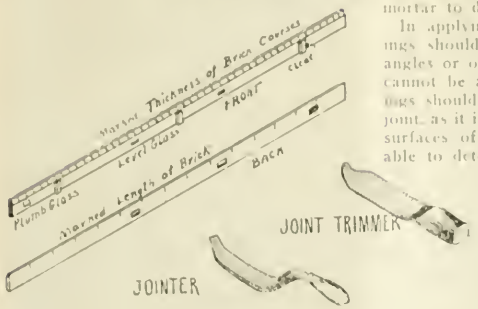
A Durable Stucco Job

WHILE a student in the Bricklaying Class of the New York Trade School I had the importance of having brick and stone properly dampened when built into a wall impressed on my mind.

A water soaked brick or stone, if built into the wall in that condition, was more injurious to mortar than if they were dry as the water begins to run out of them as soon as they are set on the mortar and carries with it the cementing qualities of the mortar, while if properly damp the molecules of the mortar will be drawn into the pores of the brick or stone by

suction or capillary attraction as in drying the water first leaves the heart of a brick or stone when built in the wall.

In the year 1898 I built a brick building and as the walls were being built all exterior joints of the brick work were raked out to a depth of about ½ inch. This gave a good bond to the stucco which was applied as soon as the building was under roof. Before applying the stucco the walls were made thoroughly damp and kept damp for at least ten days after the stucco was applied. It is essential to keep fresh stucco damp and to dry slowly.



The stucco was made one part cement, one-fourth part lime putty and two and one-half parts coarse marble dust and just enough mineral color to bring the mortar to a dark cherry red. The marble dust, cement and color were passed through a screen until the mass became an even color and then the lime putty was added and then just enough water was used to make a plastic mortar and then applied to the walls to a thickness of about one-fourth of an inch with a plasterer's trowel and brought to a smooth, even finish.

Before the initial set of the stucco took place I applied the mortar joints to give the wall the appearance of being built of pressed brick laid up in white mortar. I used a convexed joint 3/16 in. wide and with a projection of ⅛ in. The mortar for the joint was composed of one part cement, one-fourth part lime putty, and two parts fine marble dust. This gave a dense tenacious mortar of a light grey color which was applied in the following manner: The mortar was spread the full length of a straight edge which was 5 in. wide and 8 ft. long. Two mechanics held the straight edge with the feather edge against the wall with one hand each, while with the other hand they applied the joint with a convexed jointer and when the joint was applied and thoroughly pressed into the soft stucco, the straight edge was revolved so its flat was against the wall and the surplus mortar removed from the sides of the joint with a tool made from an ordinary table knife. The straight edge had the thickness of the courses marked on one edge and the lengths of the brick on another edge; those marks are transferred to the soft stucco to be used as guides in applying the joint. The straight edge also contains a plumb and level to aid in keeping the joints level and plumb. On the back of the straight edge there are three cleats to hold the straight edge away from the wall while trimming the joints to allow the fragments of mortar to drop to the ground.

In applying the work the joinings should come at corners and angles or openings and where this cannot be accomplished, the joinings should come under a mortar joint, as it is impossible to join two surfaces of stucco without being able to detect the joinings unless they are blinded in some way. When the stucco has set, all loose fragments of mortar caused by trimming the joints are removed by using a wide soft brush. This piece of work is more than 21 years old and is as good today as the day it was applied. —D. W. Daley.

Blasting Down Buildings

THE County Commissioner of St. Mary's County, Maryland, wanted the old poorhouse torn down. It was a brick building, three stories high with basement. The building was about 30x40 ft. with a large brick chimney at each end. There were eight fireplaces, each large enough to hold logs 4 ft. long. The building had been burned and only the brick walls were to be disposed of.

As they wanted the work done quickly and as labor was very scarce, they asked me if the walls could not be blasted down with dynamite. I had never done any work of that kind before so I decided it would be best to blast down one side of the building at a time.

I first marked off the places where I wanted the holes drilled. The walls were about 2 feet thick. The chimneys were triangular in shape with the partition walls built into them. The fireplaces were in the corners of the rooms.

I had the holes made with a pick about half way through the wall and about 6 to 8 inches in diameter. The walls where they joined the chimneys were about 4 to 5 feet thick and it was necessary to make the holes deeper in those sections.

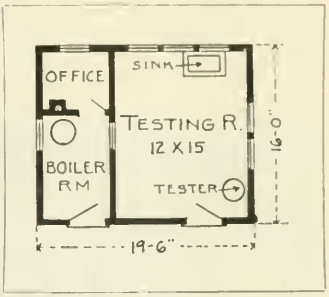
I loaded three cartridges (1½ pounds) of 30% dynamite in the shallow holes and five cartridges (2½ pounds) in the deep holes. The holes were spaced about 6 feet apart along the walls. The charges were all tamped in the holes with some damp clay. Electric blasting caps were used as I desired the cumulative effect of the shots and wanted to fire them all at the same instant with a blasting machine.

After the first shot, the entire side of the building, including the chimney, was down flat on the ground. The same method was then employed on the other sides.

To one who has never handled dynamite this may seem to be very risky work. Dynamite can be used with perfect safety if one observes simple, common sense precautions; you cannot be careless in its use, however, without danger.

We found this to be a very quick, cheap and labor saving method of tearing down brick walls. It was only at the immediate point of the blast that the bricks were broken and most of them could be used again in building construction after cleaning the mortar off them the same as would have had to be done had the building been taken down by any other method.

It required but 55 pounds of dynamite and 35 blasting caps to dispose of the entire building. The caps cost about six cents apiece and the dynamite about eighteen cents a pound. Two men did the entire job in a little over one day. From this it will be seen that the cost was very low.—Harry Gough.



A Simple Milk House

THE picture presented herewith shows a small milk house of simple, substantial construction. It is of frame covered with bishopric sheathing and stuccoed. The roof is of 2x4 inch rafters, sheathed, with 1x8 inch



boards, and covered with asbestos shingles. The plan shows the dimensions and it has proved a handy layout. —Philip Dyke.

Built In Features

Which Make the Modern Home

MODERN housewives are demanding many built-in features in their new homes and the alert builder is the one who will cater to this desire. As this kind of work can be done indoors it is desirable for the winter season.

An artistic arrangement of china closets on each side of a door is shown here; the door opening leads to an enclosed porch, the doors have semi-circular tops. Grouped in this novel way the three doors truly present an artistic appearance.

Below is a kitchen arrangement that will certainly please the ladies. The sink has drain boards on each side with drawer and cupboard below.



Artistic Arrangement of China Closets



Observe Lighting Arrangements in this Model Kitchen



Built-In Book Case Flush With Wall

Ideas for Conveniences

That Will Help Sell the House

MANY of the built in features shown on these two pages can be introduced into existing houses as well as in new construction.

Here is a novel arrangement for a built in bookcase that is flush with the wall alongside of an open fireplace. The kitchen range is on the other side of the fireplace and the space above the bookcase is used for a cupboard on the kitchen side.

The bathroom closet arrangement shown below is a handy arrangement. The two high windows give plenty of light for the use of the mirror which is on the door of a shallow closet set in between the studs. Drawers for linen are provided.



Bathroom Closets Give Plenty of Room for Linen, Supplies, Etc.

Back to First Principles in Building

By NOBLE FOSTER HOGGSON

BUILDING operations of ancient time were carried out under one directing head—witness King Solomon's Temple. It was not until modern times that there developed a practice which involved a division of responsibility, architects came to perform one function, contractors another and decorators still another. This procedure has been found far from satisfactory, and the twentieth century has seen the growth of a new type of builder—the construction organization which furnishes a complete building service, including architectural plans, the construction of the building and furnishing the interior.

A building operation of importance calls for the service of many different professions; for the employment of scores of trades; for the selection and purchase of hundreds of different materials and devices.

Successful buildings are not the results of chance. To coordinate and direct all the factors of a building operation so that the outcome will be satisfactory in design, plan, quality and cost is a profession in itself and demands experience and a knowledge of all these factors.

There are a growing number of large construction organizations which include in their personnel, architects, engineers, experienced builders, and students of markets and materials. Such organizations make one contract with an owner which includes architectural design, building construction, decoration, equipment and furnishing.

Cooperation under this form of procedure is secured from the start and it comes as close as is humanly possible to insuring that a building will be completed promptly, satisfactorily, and within the limit of expenditure.

BEFORE any plans are drawn or even a survey made, a conferance is held between the owners and the representatives of the builders at which is determined the procedure with due regard to expense as well as design. The costs of equipment, lighting fixtures, furniture and decorations as well as of the actual construction, are taken into consideration. The cost of the individual items are in this way properly apportioned in accordance with the proposed total expenditure.

COSTS and design having been adjusted and fixed the architectural department of the construction company proceeds with preparation of preliminary designs. While these plans are being completed the construction department is constantly called in for comment and suggestion.

In all such operations it is required that the architectural department and the construction department endorse the plans and specifications as to their conformance with the best and most economical practice for the project in hand, after which they are transferred to the estimating department for a detailed estimate of cost. When the estimate is complete the plans of the building including exterior perspective, interior perspective and detail floor plans, together with samples of suitable materials, stone, metal and textiles, are presented for consideration and approval by the owners.

After the approval of the preliminary plans, final working drawings are developed and represent a project for which the building organization assumes entire responsibility and guarantees the ultimate cost.

Relative Values of Elements Entering Into the Costs of a Composite Building

THE division of costs of an imaginary composite building here shown has been arrived at by taking the actual cost figures on seven different types of buildings, including an ordinary two-story brick dwelling (row type), a detached residence, a reinforced concrete factory building, a slow burning construction warehouse building, a steel frame office building, a fireproof and wood floor school building, with stone walls, and a brick apartment house.

Analysis in percentages of cost of a composite building, showing average values of various items for each $100 worth of building work normally done in Philadelphia district:

LABOR—		
All skilled labor and supervision on the building, including also stone cutting, and shop work on sheet metal and millwork only		$27.55
Unskilled labor as above		9.44
Office, estimating, general supervision and engineering salaries		5.60
Liability insurance		1.41
Total labor (no manufacturing except as stated)		$44.00
MATERIALS—		
Lumber for millwork, concrete forms and structure delivered at site	$8.86	
Bricks delivered at site	6.10	
Steel—structural, miscellaneous and reinforcement, delivered at site	5.03	
Boilers, heaters, piping, etc., for heating	3.05	
Plumbing fixtures, piping, etc	2.70	
Cement f. o. b. cars	2.60	
Hardware, nails and similar miscellaneous materials	1.78	
Sand, delivered to site	1.69	
Electric fixtures, conduit wire, etc	1.00	
Stone, slag and pebbles for concrete	1.49	
Sprinklers and fire protection apparatus and minor unclassified items	1.04	
Building stone	.90	
Amount carried forward		$37.80
Amount brought forward		$37.80
Paint		.76
Roofing and sheet metal materials		.76
Plastering materials (no sand)		.65
Lathing materials		.65
Steel sash, etc., delivered to site		.50
Lime (no plaster)		.45
Glass		.40
Cut stone (materials) and terra cotta		.38
Elevators (delivered to site)		.28
Mechanical equipment, cranes, etc		.21
Tile and marble (materials only)		.10
		$42.88
OVERHEAD EXPENSE AND PROFIT—		
Office rent, taxes, interest, depreciation of equipment, general expense and overhead (not wages)		$5.80
Net compensation of all sub-contractors (assumed as doing 65% of the work direct)		3.90
Net compensation of general contractor (assumed as doing 35% of the work direct and supervising the balance)		3.42
		$13.12
		$100.00



A Stucco Two Family House

TWO family houses have their particular advantage. The one shown here was built by Mr Charles E. Foster, of the Foster Lumber and Coal Co., at Valparaiso, Ind., and is a good example of what can be accomplished in this line. Mr. Foster occupies one floor, and his daughter the other.

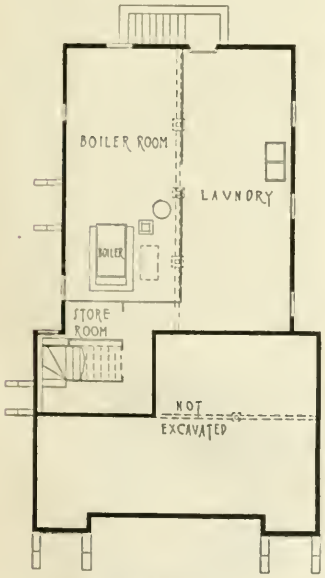
The exterior appearance is decidedly striking, with a combined treatment of stucco, paneled front, attractive doorways, etc. It was built last year, when prices were high, and cost nearly $20,000. The interior is well finished, hardwood floors and trim, with a number of built-in features.

As will be noted, each apartment is really a separate house; each has its own front entrance and kitchen entrance. All rooms are reached from the central hall.

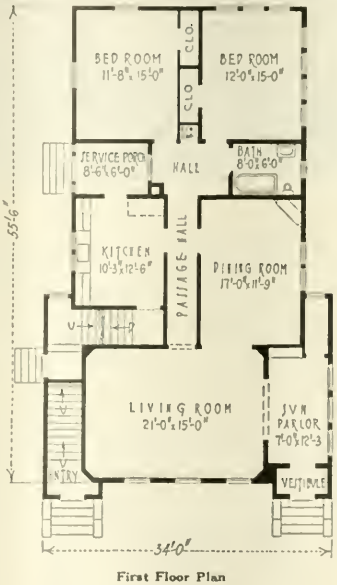
The cellar is reached only from the first floor kitchen; the second floor family can reach the cellar from the rear outside entry. The front partition of the house is not excavated, but there is ample room for boiler room, coal storage, laundry, etc.

Each floor has its sun parlor, the one upstairs being of considerable size; each is provided with a large closet. French doors connect it with the living room.

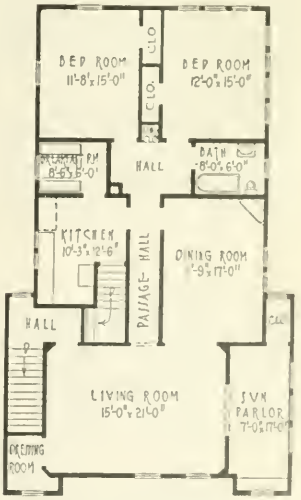
The first floor has a small side or service porch, and the space this occupies is utilized upstairs as a breakfast room. Each bedroom has a large closet and a linen closet opens on the hall, easy of access from all rooms.



Basement Plan



First Floor Plan



Second Floor Plan



Attractive Cottage of English Design

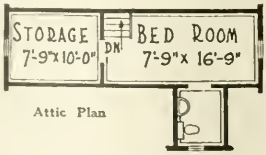
FOR a small house the English design shown herewith is one that is very attractive, compact and practical. It may be built of hollow tile or wood frame and stuccoed. The same design would look artistic with the walls carried out in face brick, having the twin dormer gables stuccoed in English half timber fashion as shown.

There is no entrance hall; one enters the house direct from the porch into the living room from which the dining room opens. It will be noticed that one can go directly from the kitchen to the stair landing without going through the dining room and living room, this feature gives the advantage of a rear stairway.

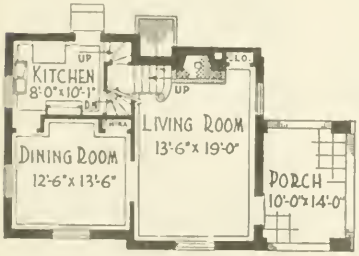
In the dining room a space for sideboard has been provided in a recess. The stairway from the living room ascends alongside of the fireplace, and this combination makes an attractive feature of this end of the room.

On the second floor there are three bedrooms, one large and two smaller ones, together with the bathroom. Each bedroom is provided with a closet, and there is a linen closet in the hall. If desired the attic can have two bedrooms, also a toilet room.

The house shown here was built at Narbeth, Pa. Messrs. Wallace & Warner of Philadelphia, were the architects. There was no general contractor on the job but the architects sublet each contract and supervised the construction of the house.



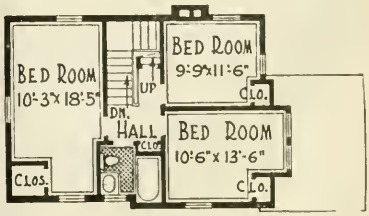
Attic Plan



The First Floor Plan is Shown at the Left.

The porch is arranged so that it can be closed in for the winter with glass and screened for summer use.

The Second Floor Plan is Shown at the Right. Observe the compact arrangement of bedrooms, bath, etc., all served by the small central hall, eliminating waste space.



What the Editor Thinks

The Offense of the Ugly Building

ONE of our contributors this month writes very interestingly about "Beauty vs Service In Building Construction." The point brought out by the author is worthy of considerable serious thought on the part of every building contractor.

BUILDING AGE is advocating better design and construction, and this article is in line with our policy. Some builders have been very persistent in putting up ugly looking buildings. They seem to have a perfect mania for so doing. When a set of plans is shown them that has even one feature that would really look well, they begin to hem and haw and tell the owner "that is very expensive and it will take cabinet makers to do the job, etc."

What architect has not suffered chagrin and regret on viewing the completed house for which he drew the plans and spent many hours of thought in getting things worked out right, so that all would have a pleasing appearance? The window arrangement balanced, and a little bit of moulding here and there, a piece of lattice at another point where there was a big blank wall space, and then —the practical builder gets hold of the job and strips it of every vestige of beauty with the mistaken idea that he is saving in cost!

Let us build good looking houses, something that will be a credit to ourselves and our community. All this would tend to raise the standard of the builders' craft. We sometimes wonder why the general public look down upon the building industry merely as a necessary evil.

It is within the power of the builders themselves to remedy the evil. It will take a little courage for a builder to say: "No, I will not undertake this job; it is not up to the standard; there will be no credit for me to do it."

By erecting well designed structures a builder will gain a very enviable reputation which will be the means of securing many a valuable contract from those who want good work.

Let us all strive to make 1922 a year of better building, both in design as well as in construction.

Building Ethics

DIFFERENT professions and trades endeavoring to be set right before the public have adopted a sort of creed stating the policy of their members in conducting their business. Honest efforts to live up to such a code of ethics are all productive of good.

Due to the shortage of homes there has been page after page in the newspapers about the building industry, and there has been a good deal of just and unjust criticism of those engaged in this business.

Public confidence can only be had by promoting faith and fairness to the public and the various callings that go to make up the building industry; realizing this a Code of Ethics has been prepared and approved by the New York Building Congress at a meeting held December 13, 1921, and this we are pleased to publish on another page. Let us all do our best in trying to live up to these rules —it will make our industry more respected—we ourselves will have a good deal of respect for our own calling.

The proper housing of the citizens and industries of the United States is a very essential business for the future good of our country. It is in safe hands—let all help to raise its standard.

Pleasing the Owner

THE builder who wishes to succeed should make a careful study of the little features that please the home owner.

Be prepared to show them the advantage of some built-in furniture, etc. Give a little thought to how the doors swing.

People vary in size, therefore get sinks, cabinets, etc., at the proper height so that they will be comfortable to work at.

Two Remarkable Building Jobs

IN this issue of BUILDING AGE we have the pleasure of describing a remarkable alteration job that is just about completed. A reading of this article will reveal the daring of the enterprise and the careful precautions taken by the contractors for safety.

We are truly sorry to publish the article on the other remarkable building job—a gigantic fatal failure. The one job was a big success; the other a catastrophe.

The building business requires brains and honesty as well as any other big business. There is work in the building business for big men and it has attractions other than just mere financial gain. It is a pleasure and a pride to do a big job and to feel that you were a party to it.

Illegal Building Practices

IN New York City some ugly revelations are being made regarding "rings" among certain building material dealers, contractors and labor unions. For the good of the building industry as a whole it is well to have these irregular practices exposed. No business can succeed if it is dishonestly conducted, and every honest man connected with the building industry will be glad of this house cleaning. It showed clearly that there are few wrong-doers, but it also showed very clearly that the great majority of men in the building field are straightforward, honest, business men.

The Building Industry

THE construction industry of the United States is the greatest industry in the world. It employs more men than any other industry, provides approximately 30 per cent. of the total railroad tonnage of the country, and in normal times produces annually from three billions to four billions of additional permanent taxable wealth.

Review of Building Situation

CONSTRUCTION activity in November, according to figures published by the F. W. Dodge Co., show that the total amount of contracts awarded (not contemplated) amounted to $192,311,300. This was 45% ahead of November, 1920, and is only 14% under the total for October, whereas November is normally 24% less than October.

All districts except New England and Middle West showed marked increases over the corresponding month of 1920—the decreases in these two districts were very slight, only 1% and 3% respectively.

Residential building continues in the lead, even showing a slight increase over October.

The fact that construction activity is holding up more than usually well with the approach of the winter season is a good indication of an increased volume of activity in 1922.

The contemplated projects in residential construction alone amount to $145,864,000 and $91,583,800 of this is for the three Northeastern Districts. The outlook in the midwest, etc., while not as good as the coast, need cause no one to worry as it is a decidedly healthy showing. This shows very clearly where the bulk of the residence building for 1922 will be done. Builders in the East can prepare for one of the best year's business they have ever had.

Home Building in 1921

THERE was a decided increase in the construction of dwelling houses in this country during the first ten months of 1921, according to information obtained by the Civic Development Department of the Chamber of Commerce of the United United States.

Construction figures furnished by forty-four important cities, show that during the period from January to October of the present year $603,000,000 went into new construction, while during all 1920 the total in the same cities was only $8,000,000 more. During the shorter period this year 57.9 per cent. of the total was for dwelling houses as against only 36.1 per cent. in 1920.

Figures from some of the reporting cities are not brought up to date as it is not universal practice to make monthly reports, and the indications are that the dwelling percentage will be larger when all figures are in, according to the National Chamber's report.

The estimated cost of all construction reported in the forty-four cities for ten months of 1921 exceeds $722,000,000, of which $349,000,000 is residential, and $254,000,000 nonresidential. Alterations, repairs and special construction cost $119,000,000. Not only would these totals be increased if all reports were up-to-date, according to the National Chamber, but as costs have been reduced, each dollar this year represents an increased volume of construction.

The total estimated cost reported by the same cities for the entire year of 1920 was $798,000,000.

Record of November, 1921, Building Contracts Awarded

Classification of Building	SECTION OF COUNTRY New England District	New York District	Mid. Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$3,302,200	$5,720,500	$4,785,600	$3,632,400	$5,688,900	$1,091,000	$24,220,600
Educational	732,800	3,386,000	3,510,300	5,372,200	4,801,100	409,200	18,211,600
Hospitals and Institutions	1,923,000	552,400	513,600	138,000	1,375,000	4,000	4,506,000
Industrial	1,011,100	4,342,400	2,217,800	6,250,500	3,745,000	128,300	17,695,100
Military and Naval	.....	.....	10,000	50,000	55,000	.....	115,000
Public Buildings	295,700	27,300	310,800	56,400	193,500	.....	883,700
Public Works and Utilities	2,424,700	646,900	7,654,700	3,847,800	10,999,400	823,100	26,396,600
Religious and Memorial	227,000	556,000	533,700	409,000	1,330,500	189,400	3,245,600
Residential	7,746,000	40,599,500	10,448,500	13,291,500	16,231,900	2,006,500	90,323,900
Social and Recreational	741,100	3,019,000	323,200	1,538,600	1,041,300	50,000	6,713,200
Miscellaneous	.....	.....	.....	.....	.....	.....	.....
Total	$18,403,600	$58,850,000	$30,308,200	$34,586,400	$45,461,600	$4,701,500	$192,311,300

Building Projects Contemplated November, 1921

Classification of Buildings	SECTION OF COUNTRY New England District	New York District	Mid. Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$5,810,200	$7,076,100	$5,422,100	$5,678,100	$15,489,500	$1,891,200	$41,367,200
Educational	2,542,500	2,643,800	1,795,000	3,405,000	8,216,600	2,695,000	21,297,900
Hospitals and Institutions	1,333,000	335,100	965,500	218,000	4,977,200	133,000	7,961,800
Industrial	2,666,500	2,852,300	5,405,800	3,404,500	21,185,000	30,234,800	65,748,900
Military and Naval	275,000	5,000	.....	.....	50,000	5,000	335,000
Public Buildings	252,000	47,400	242,000	151,100	4,706,000	1,558,600	6,957,100
Public Works and Utilities	1,964,000	4,265,300	15,048,400	5,904,500	49,419,100	4,801,400	81,402,700
Religious and Memorial	955,000	698,000	991,200	838,000	4,696,000	243,000	8,421,200
Residential	9,797,300	63,998,000	17,788,500	17,687,700	33,956,400	2,636,100	145,864,000
Social and Recreational	781,100	4,247,800	1,364,000	1,835,500	8,004,000	77,500	16,309,900
Miscellaneous	.....	.....	.....	.....	.....	.....	.....
Total	$26,376,600	$86,168,800	$49,022,500	$39,122,400	$150,699,800	$44,275,600	$395,665,700



EASE

in opening and closing a garage door is of fundamental importance. "Sticking" is an evil that causes much criticism of Builders.

PROTECTION

against the rigors of winter is another indispensable feature of a garage door. It should be entirely weather-tight. Snow and ice should not in any way interfere with opening and closing the door.

To secure Ease and Protection is a problem every builder can easily solve to the delight of his customers.

NATIONAL
Nos. 805 and 806
Garage Door Sets

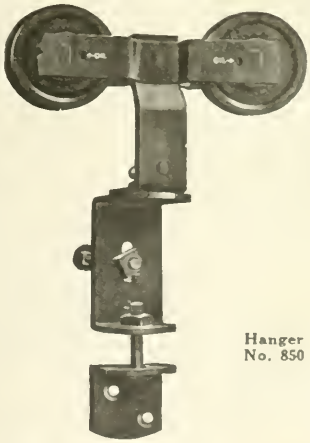
are so constructed that a child can open and close the door—a slight push or pull and the doors are wide open or closed. There is not the slightest binding or friction. They are entirely weather and storm proof.

You will secure these two important qualities and also the other qualities of free and easy access, adjustable feature preventing sagging of doors, minimum space, and reasonable price.

Send for Garage Booklet "F"

NATIONAL MANUFACTURING COMPANY

Sterling, Ill.



Hanger No. 850

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	Nov. 18	Dec. 23
LONG LEAF YELLOW PINE—		
[illegible]	[illegible]	$81.00
[illegible]	[illegible]	40.00
[illegible]	[illegible]	49.50
[illegible]	[illegible]	32.50
[illegible]	4[illegible]	64.00
[illegible]	[illegible]	42.00
NORTH CAROLINA PINE—		
[illegible]	[illegible]	$67.00
[illegible]	[illegible]	29.00
DOUGLAS FIR—		
[illegible]	$78.50	$78.50
[illegible]	76.00	76.00
[illegible]	43.00	43.00
[illegible]	52.25	52.25
[illegible]	90.12	90.12
[illegible]	40.00	40.00
[illegible]	54.00	54.00
WESTERN RED CEDAR—		
[illegible]	$7.60	$7.60
[illegible]	7.20	7.20
[illegible]	44.50	44.50
CANADIAN SPRUCE—		
[illegible]	$9.50	$8.25
[illegible]	34.00	34.00
HARDWOOD FLOORING—		
[illegible]	$147.50	$147.50
[illegible]	105.00	106.25
[illegible]	95.50	95.50
[illegible]	142.50	142.50
[illegible]	87.50	87.50
(All other prices firm, fixed by LUMBER)		
COMMON BRICK—		
[illegible]	$17.50	$17.50
PORTLAND CEMENT—		
[illegible]	$2.60	$2.35
STRUCTURAL STEEL (IRON AGE)—		
[illegible]	$2.00	$1.98
CRUSHED STONE (cu. yd.)—		
[illegible]	$2.90	$2.80
[illegible]	2.75	2.65
WALL BOARD—		
[illegible]	$60.00	$60.00
[illegible]	55.00	55.00
METAL LATH—		
[illegible]	$25.95	$20.65
[illegible]	24.40	24.60
[illegible]	30.35	27.35
[illegible]		
LIME (Hydrate)—		
[illegible]	$0.60	$0.60
[illegible]	.45	.45
SAND AND GRAVEL (cu. yd.)—		
[illegible]	$1.50	$1.65
[illegible]	3.00	2.80
[illegible]	3.00	2.80
FACE BRICK—		
[illegible]	$45.00	$45.00
[illegible]		40.50
[illegible]	47.00	50.00
[illegible]	32.50	32.50
SHINGLES (per square)—		
[illegible]	$7.00	$7.00
[illegible]	6.50	7.45
STAINED WOOD SHINGLES (per square)—		
[illegible]	$[illegible]	$10.51
[illegible]	10.00	10.[illegible]
[illegible]	11.00	11.[illegible]
[illegible]	10.50	11.[illegible]
[illegible]	11.10	11.70

CHICAGO PRICES

YELLOW PINE—		
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]



Redwood—and the permanent beauty of the white house

BUILDERS know all about the troubles some woods give before you can get even a passably good job of white painting.

When Redwood is specified, the most attractive and long-lasting painting job is assured. There's no pitch in Redwood to "bleed" through, nor hard and soft spots to mar the painter's work. Redwood's uniform texture provides surfaces which take and hold paint well.

Properly dried Redwood—painted, stained or unpainted—does not warp, shrink, swell or decay. It assures both permanence and beauty.

Our Redwood "Construction Digest" and our "Engineering Digest" contain much useful data for architects, builders and engineers, indicating the exceptional suitability of Redwood siding, shingles, trim, columns, mouldings, pickets, balusters, gutters, window and door frames—for all exterior construction work where resistance to decay-producing fungus, boring insects and the ceaseless warfare of the elements demands the most enduring wood.

Our Chicago or New York office will gladly send you these digests and any detailed information you may desire.

Redwood should be specified for

Exterior Construction

Including—Colonial siding, clapboards, shingles, door and window frames, gutters, eaves, water tables and mudsills—porch rail, balusters and columns, mouldings and lattice, pickets and fencing—pergolas and greenhouses.

Interior Finish

Industrial Uses

Tanks and vats for water, chemicals and oil. Factory roofs and gutters. Wood block flooring.

Redwood should be specified for

Wood Specialties

Such as Caskets and burial boxes, incubators and ice-cream cabinets, cigar and candy boxes, etc.

Railroad Uses

Such as Railroad ties and tunnel timbers—signal wire conduits and water tanks, car siding and roofing.

Farm and Dairy Uses

Such as Silos, tanks and troughs—hog feeders and implement sheds—wood block floors, etc.

THE PACIFIC LUMBER CO. of Illinois

2070 McCormick Building Chicago
832 No. 40 Rector St. Building New York City

THE PACIFIC LUMBER CO., San Francisco, Los Angeles
Export Company
A. F. THANE & CO., 40 Rector Street, New York City
311 California Street, San Francisco

The Pacific Lumber Co.

Redwood

The Largest Manufacturers and Distributors of California Redwood

"The Western wood for Eastern homes"



Legal - Department

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age, 920 Broadway, New York City.

Substantiol Performance of Building Contracts

THERE is a trite principle of building law that sometimes puzzles the courts in the matter of its application to concrete cases It is the rule that where a builder substantially performs a contract in good faith, although not in strict compliance with the contract, he will be permitted to recover the contract price, less a fair deduction in favor of the owner on account of the trivial defects. The trouble arises in determining when a particular contract has been "substantially" performed, and when a defect is "trivial."

The California District Court of Appeal was lately confronted with a case of this kind (Joseph Musto Sons-Keenan Co. vs. Pacific States Corporation, 192 Pacific Reporter, 138). It was shown that a building contract involved more than $30,000 in tiled flooring and marble wainscoting. Here and there were defects, consisting of nicks in marble edges, slightly imperfect joints, uncleaned oil spots, failure of pieces of marble to exactly match or take the same degree of polish, etc. But it was found that an expenditure of $469 would correct any real defects in the work, and that the supervising architect and the owner's president made no objections while the work was being done, although they inspected the work at times when any such defects could have been readily corrected. The court says:

"In our opinion, the question as to whether the contract was substantially performed should be determined upon a view of each class of work considered as a whole; and, so considered, it appears that each class of work was done in strict accordance with the design therefor, and the material used was that called for in the specifications, and, save and except imperfections existing, but not pervasive, for which recoupment was allowed to defendant, it, as completed, constituted a substantial performance of the contract. In such a controversy witnesses will differ in taste as to whether one piece of marble matches another, or whether the joints between the pieces are too wide or too narrow, according to their respective tastes and opinions. . . . This testimony . . . is sufficient to show that the work, as completed and taken as a whole, was a first-class job of work, and done in substantial conformity to the specifications, even though it be conceded that some of the pieces of marble might not be in accordance with individual tastes, that some of the pieces of tiling were not so closely joined as to accord with individual ideas as to workmanship, or that, in some cases, small snips and nicks appeared in the edges of pieces of tile and marble"

Importance of Detail in Drawing Building Contracts

EXPERIENCE has amply demonstrated the value of great care in the preparation of building contracts and specifications. Hundreds of appellate court decisions suggest the warning that the builder who fails to insist upon as much specification of detail as is at all feasible is running grave risks of becoming involved in litigation. This suggestion applies with particular force to structural features which the builder does not understand he is to furnish, but which may be shown or hinted at in the plans. An example is afforded in an Illinois case where it took litigation, carried through to the highest court of the state, to establish the fact that a contract for the erection of a building did not require the contractor to furnish skylights shown by the plans. In this case, the original plans showed openings for skylights, but nothing as to the size, weights or data concerning the lights. In holding that the skylights were not included in the contract, the Supreme Court said:

"The entire work was to be done according to said plans and specifications, and upon turning to them, so far as they relate to the skylights, we find that they show the openings and iron framework constituting the framework for five skylights. We also discover certain lines passing across the openings which indicate that skylight superstructures of some kind were ultimately intended for the building; but no sizes, weights, or data are given to guide one, either in their construction or in estimating their cost, except the size of the openings. Had the appellant (the contractor) been forced to construct skylights under the circumstances, he would have been compelled to have either gotten up an additional plan and specifications for his employes to work by, or the city would have to furnish them, in neither of which cases would they have been constructed according to the plans and specifications on file in the appellee's office at the time the contract was entered into."

Is This Architect Entitled to Compensation?

From C. M. B., Cal. —About a year ago I employed an architect to prepare plans and specifications for a house to cost not more than $16,500. The construction was to be of hollow tile. During the time that was required to prepare all of them the stipulated price was mentioned and was referred to by the architect as the estimated cost of the building desired. There was no contract or agreement entered into by us. It, however, took about a month longer to complete the working drawings than had been promised me and during that time there was a slight increase in the cost of materials. When the contractor's bid was received the price of the house was $33,000. This included the 10% commission of the architect. I was unable to pay this price and hence the plans were useless to me. The architect having rendered some services, I was inclined to pay him something for his trouble and offered



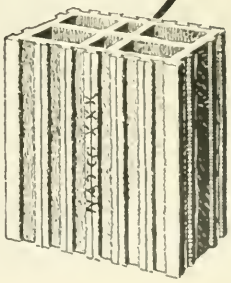
A Convincing Test of NATCO Strength

THE strength of a single NATCO XXX Tile (size 8″ x 12″ x 12″) may be deduced from the result of an endurance test made in the laboratories of Robert W. Hunt & Co., Chicago.

A NATCO Hollow Tile of the above dimensions was placed in a compression machine and the load gradually applied. At the enormous weight of 227,500 pounds continual cracking sounds were heard, but it was not until the gauge read 237,500 pounds that the tile was crushed!

In other words, *one* NATCO Hollow Tile supported a weight decidedly greater than that of an ordinary bungalow and proved beyond doubt its unequalled merit as a building material not only for homes but also for Apartment Houses, Schools, Hospitals, Theatres, Garages, Stables, Factories, Stores, Churches, Club Houses, Hotels and Farm Buildings.

A printed sheet giving this interesting test in detail will be furnished to anyone requesting it.



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um $400 in full settlement. He, however, refused this offer and demanded $1,100, or rather three-fifths of 10% of a home costing approximately $18,000. This I refused to pay. Recently his attorney has written me and said that his client is willing to accept the $400, and that if it is not paid immediately they would bring suit. My contention is I owe him nothing. Am I right?"

Answer.—If the reasonable cost of the proposed building was within the $16,500 limit, or reasonably near it, when the plans and specifications were completed, and if the increased cost later disclosed by bids could not reasonably have been foreseen by the architect, I am of the opinion that he is entitled to reasonable compensation for the services rendered. The decisive point is not so much the fact that the plans and specifications proved to be useless to you as the question whether it is the architect's fault that he failed to furnish specifications under which the building could be erected at the contemplated cost.

The law governing the case is involved in the following statement of principles summarized by a standard legal authority from appellate court decisions of the various states:-

"Where plans are required for a building not to cost more than a certain sum, or are accepted on condition that it can be erected for a given amount, there can be no recovery by the architect unless the building can be erected for the sum named, *or unless the increased cost is due to special circumstances*, or to a change of plans by direction of the owner. But as this condition is intended for the protection of the owner it may be waived by him by any act which clearly shows such an intention, as where he accepts the plans with the knowledge that the cost of the building will exceed the sum originally proposed. . . .

"Some of the cases . . . hold that an architect who prepares plans for a building pursuant to the order of the owner that the building shall not exceed a certain cost is entitled to his compensation if the cost is 'reasonably near' the proposed amount, and whether there is a reasonable approximation of the actual cost to the proposed cost is ordinarily a question for the jury, although if the excess is great the court can deal with it as a question of law

"In determining whether the proposed building can be erected for the estimated sum the architect's fees cannot be regarded as part of the estimate." 5 Corpus Juris, 262, 263.

If by reason of the architect's failure to furnish the working drawings within the time he promised them to you prices of labor and material so advanced in the meantime that the house could not be reconstructed for $16,500, or reasonably near that price, I am of the opinion that you are not legally liable to him for any compensation. In this view of the case, you offer to pay $400, not having been accepted within a reasonable time is not binding upon you.

But you intimate that *after the services were rendered* there was such advance in building cost as prevented construction at less than $30,000, exclusive of the architect's fee. If this is so, the chances are that the architect would be held to reasonable pay for his services. But, as already noted, the recovery must rest on the point that, except for unexpected rise of building costs, the building could have been erected strictly or substantially within the $16,550 limit.

In the Nova Scotia case of Hutchinson vs. Conway, 34 N. S. 554, it was held that where increased cost of a projected building was due to an increase in the cost of material, shortness of the season in which the work had to be done, etc., the architect was entitled to a commission on the contemplated cost.

And the Maine Supreme Judicial Court has gone so far as to hold that an architect employed to make plans for a house not to exceed a certain sum, would not be barred of recovery for his services in drawing plans by an honest mistake or miscalculation as to the cost. Coombs vs. Beede, 89 Me. 187, 36 A. 104, 56 Am. State Rep. 406.

On the facts presented, I am inclined to advise payment of the $400, since you originally recognized that as a sum fairly due the architect, and since it would be expensive to defend suit, to say nothing of the possibility of his recovering a larger sum.

"It is probably true that one who employs an architect to devise and prepare plans and specifications for a building and pays him therefor becomes the owner of such plans and specifications *unless the contract provides that they are not to become his property*. Gibbon v. Pease, 2 Ann Cas. 713, and cases cited in note. But the court found as a fact that plaintiff was the owner of the plans in controversy and that defendant procured for use in constructing the second house under an agreement to pay plaintiff for them.

"The specifications accompanying the plans contained a statement to the effect that all drawings and specifications were the property of plaintiff and were to be returned to him. Defendant insists that this statement was not a part of the contract and was not binding upon or evidence against him, and that the court erred in admitting this provision of the specifications in evidence. Whether this provision was binding upon or evidence against defendant depends upon the facts and circumstances shown by the evidence. As it does not appear that all the evidence is before us, were are not in position to say that the ruling was error. * * *

As applied to the question raised by the gentleman from Colorado, the Minnesota decision is authority for saying that an architect may retain ownership of plans and specifications by express reservation in the contract under which he is retained, and may guard against the owner's use of them on a second house without paying for them. For stronger reasons, where an architect has reserved ownership of plans and specifications, he is entitled to recover against some third person who may steal them and use them without the architect's knowledge or consent.

For a more specific discussion of the architect's proprietary rights in his work, we refer our readers to another article in this department of THE BUILDING AGE, entitled "What Proprietary Rights Does the Law Give the Architect in His Work?" That article, which has not been published at the writing hereof, refers to the following pertinent legal authorities: 5 Corpus Juris, 259; 13 Corpus Juris, 963. Wright vs. Eisle, 86 N. Y. App. Div. Rep. 356, 93 N. Y. Supp. 887.

Reservation of Title to Articles Installed in Buildings

THE New York Court of Appeals was lately called upon to consider the interesting question as to how far it is possible for a building contractor and one from whom he buys bath tubs, bookcases and other articles for installation in a building under contract with the owner, to make a binding contract that title to these things are to be retained in the seller until payment of the purchase price.

It is held that, subject to intervening rights of third persons acquiring interests in the property without notice of such reservation, the contractor and the seller of the articles may, as between themselves, stipulate that the articles shall retain their character as personal property even after installation on the real estate, provided that they can be removed without practically destroying them or removing the support of that to which they are attached. And it was intimated that the mere fact that removal of bookcases would leave exposed an unplastered part of walls would not necessarily prevent their removal, as against the purchaser of the premises at a sale of the real estate under foreclosure of a mortgage.

The Court of Appeals orders a new trial of the case to produce more satisfactory proof as to whether certain plumbing fixtures, bookcases, etc., could be removed without material injury to the real property; this being treated as the test of the validity of an attempted reservation of title by the dealer who sold the articles for installation in the particular building.



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New Catalogs and Publications

THESE catalogs may be secured direct from the manufacturer. If you prefer, write the date of this issue and the numbers of any catalogs on a postal and mail it to "Building Age," 912-920 Broadway, New York City. The catalogs will be sent you without charge, unless otherwise noted.

1. **Weatherstrips** should certainly be in demand in January. It is a good time to solicit this business for houses not already equipped. Much valuable information for contractors can be had on the subject by writing to the All-metal Weatherstrip Co., 122 W. Kenzie St., Chicago, Ill.

2. **Concrete Mixers** are a great aid to efficient construction work. The Construction Machinery Company, 403 Vinton St., Waterloo, Iowa, make the Wonder Mixers, and they will be pleased to send a descriptive circular giving full details, prices, etc.

3. **Pipeless Furnaces** are very efficient heaters for school houses, churches, stores and homes. A catalog explaining this is issued by the Co-operative Foundry Company, Rochester, N. Y., and will be sent to interested parties.

4. **Woodworking Machines** are paying investments on a construction job as well as for shop work. A very interesting catalog describing various labor-saving woodworking machines has been issued by the Crescent Machine Company, 206 Main Street, Lectonia, Ohio.

5. **Hot Water Supply** is essential in the modern home. The Economy Heater Company, 108 So. LaSalle St., Chicago, have a reasonable priced combination boiler and gas water heater with automatic valve control. They will be glad to send a descriptive circular.

6. **Asphalt Roofs** for large board or concrete roofs, whether steep or flat, can be economically and durably covered with Flex-a-Tile Asphalt Roofing. Full information with specifications can be obtained from the manufacturers. The Richardson Company, 4500 Fillmore St., Chicago, Ill.

7. **Window Hardware** is a very essential part of the home equipment The right selection can be made by consulting the catalog of H. B. Ives Company, New Haven, Conn. They also make other builders' hardware.

8. **Store Fronts** should be attractive—it pays the shop keeper to have it so, and many old style store fronts should be altered. The handbook issued by the Kawneer Company, 2025 Front St., Niles, Mich., will be sent to interested contractors.

9. **Construction Work** can be produced cheaper by using the proper concrete mixer A very interesting booklet is issued by the Koehring Company, Milwaukee, Wis. which describes their dandy light mixer.

10. **A Builders' Level** is a useful instrument for the building contractor to own. It will save money and prevent mistakes on nearly every job. Koelsch & Company, 138 Fulton St., New York, will be glad to send a descriptive circular of the level they make to any reader interested.

11. **Steam Heating Efficiency** can only be obtained by having the proper air valve, as air-bound radiators cannot give off the maximum amount of heat. An efficient air valve is made by the Monash-Younker Company, 112 W. 42nd St. They have a descriptive folder which they will send to any interested party.

12. **Sliding Door Hangers** are an essential part of the equipment in garages, barns, warehouses, etc. An interesting catalog describing the Meyers Faultless Door Hangers will be sent on request by the F. E. Meyers & Bro. Co., Ashland, Ohio.

13. **Concrete Work** can only be carried on economically by having the right machinery. One will need mixers, pavers, chuting plants, buckets, bins, carts, etc. These are interestingly described in the bulletin issued by Ransome Concrete Machinery Co., 1774 Second St., Dunellen, N. J.

14. Roof Framing is comparatively easy when you have the right steel square to lay out your work. The next thing is to know how to use this square. A very interesting booklet about the Sargent Steel Square and its uses can be obtained by writing Sargent & Company, 53 Water St., New Haven, Conn.

15. **Chains** are used to advantage in many parts of a building, hanging sash, tank pulls, bolts, etc. The Smith & Egge Manufacturing Co. have an interesting booklet on the chains they manufacture, and a reference to this will enable one to pick out the right chain to use for each purpose.

16. **A Low-Priced Adding Machine** is something that would prove useful to every building contractor. An interesting circular of such a machine will be sent by the Illinois Bird Adding Machine Co., First National Bank Building, Chicago Ill.

17. **Weather Vanes** are described in a booklet issued by C. G. Washburne & Co., 207 Fulton street. New York. They also make lightning rods and rotary exhaust ventilators.

18. **Brick, How to Build and Estimate** is the title of a book by William Carver, published at $1 by the Common Brick Manufacturers Association of America, Cleveland, Ohio. This edition is the third and has been revised and enlarged. It presents a vast amount of practical data on brick construction, costs, strength, etc. It is well illustrated and worth having.

19. **Metal Lath** as used for industrial housing projects is described and illustrated in a book entitled "As a Man Liveth." Plans and views of stucco houses are shown. It is issued by Associated Metal Lath Manufacturers, Swetland Building, Cleveland, Ohio.

20. **The House Owner's Paint Book** contains valuable information on the best way to have painting done both for the interior and exterior. There are a number of artistically colored plates, giving suggestions on the proper selection of colors, etc., issued by the National Lead Co., New York, the makers of Dutch Boy White Lead.

21. **Structural Slate** as used for laundry tubs, sinks, urinal stalls and shower bath stalls are shown in a series of drawings and accompanied by valuable data and dimensioned details that have been issued by The Structural Slate Company, Penn Argyle, Pa. They will be sent to interested parties.

22. **Steel Joists and Studs** are described in a booklet published by The National Pressed Steel Co., Massillon, Ohio. Illustrations and explanations are given on the use of metal lumber in the construction of fire safe construction for the home.

23. **Spring Sash Balances** are described in an interesting booklet entitled "Detail Drawing and Information for Architects Planning the Use of Caldwell Sash Balances." The descriptions and sizes are given with instructions showing how to install, together with valuable tables giving weights of glazed sashes, etc. The booklet is issued by Caldwell Mfg. Co., Rochester, N. Y.

24. **Frame Construction Details** is an interesting book issued by the National Lumber Manufacturers Asosciation, 750 McCormick Building, Chicago, Ill., containing illustrations of recommended methods of frame construction from the sill to the rafters. Twenty-eight plates of detail drawings are given. A charge of $1 is made for the book

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The home pictured above is Long-Bell Plan No. 292. Many retail lumbermen can show you floor plans of this home. If your lumberman hasn't them write us



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This is the day of the small home. You see them everywhere and marvel at their beauty and coziness. Nine out of ten of them are built of wood because beauty, coziness and "homeyness" are best obtainable by building with lumber.

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Sash and Doors
Standardized Woodwork
Gum and Oak Lumber
Oak Flooring

The Long-Bell Lumber Company

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25. **Mixing Concrete in Winter** is the subject of an interesting circular issued by the Portland Cement Association, 111 West Washington street, Chicago, Ill. It gives practical hints on the simple equipment necessary and the methods of operation in making concrete and cement products in the winter.

26. **Builders' Hardware**, comprising various styles of butts, hinges, hasps, bolts latches, handles, garage door hardware, tracks, screen hangers, blind hinges, etc., are described in a new catalog just issued by The Stanley Works, New Britain, Conn. It is a comprehensive guide to the selection of the proper hardware for the unusual as well as the usual building job.

27. **Modern Oak Floors** is the title of an interesting booklet showing pictuers in natural colors of oak flooring, also information about grades, how to choose, laying, etc. A copy will be sent to interested parties by the Oak Flooring Manufacturers Association, 1014 Ashland Block, Chicago, Ill.

28. **Metal Weather Stripping** is a subject of timely interest now. An interesting book of Blue Print Details has just been issued by The Diamond Metal Weather Strip Co., of Columbus, Ohio, which shows how their weather strip is applied to windows of different kinds and doors so as to make them storm tight.

29. **Refrigerators and Cooling Rooms** is the title of a book issued by McCray Refrigerator Co., Kendallville, Ind., and describes the different refrigerators they manufacture especially for use in hotels, restaurants, hospitals, clubs, etc. Detail drawings show the construction.

30. **Porete**, the name of a porous, lightweight concrete slab is interestngly described in a number of circulars issued by the Porete Mfg. Co., 26 Verona avenue, Newark, N. J. These show the use of Porete "Slabs" in the construction of floors, walls and roofs that are fireproof and easily constructed.

31. **Wood Turning** is the title of a cloth bound book of 150 pages, which gives practical directions for the manipulation of the lathe in producing various turned ornaments, both plain and twisted. Nearly 200 illustrations clearly show the designs and method of working. To the practical man this $1.50 book is well worth the price.

32 Bishopric Mfg. Co., Cincinnati, Ohio, will send booklet illustrated with photographs of houses built with Bishopric stucco, plaster and sheathing units, "For all time and clime."

33 **Bay State Brick and Cement Coating** as made by the Wadsworth Howland Co., Boston, is interestingly described in their literature which should be in the hands of builders. Samples may also be had.

34. **Appalachian Marble Co.**, Knoxville, Tenn., should be consulted and addressed with reference to samples and information on marble of the finest kind and at moderate cost.

35. **Garbage Disposal** is a problem in the country house as well as the city apartment. A clean and sanitary method is by burning. The Kernerator is built in a chimney and does the work effectively, and an interesting booklet will be sent by the makers, The Kerner Incinerator Co., 1027 Chestnut Street, Milwaukee, Wis.

36. **House Plans** are shown and described in several books published by The Keith Corporation, 533 Abbay Building, Minneapolis, Minn. They also publish Keith's Magazine, a monthly devoted to home building and decoration.

37. **Hollow Concrete Walls** can be made economically by the use of the Van Guilder metal portable form, which enables the contractor to build a hollow concrete wall easily and rapidly. A descriptive circular will be sent by the manufacturer, the Van Guilder Double Wall Co., 77 South Avenue, Rochester, N. Y.

38. **Sheathing Paper** is a necessity on all buildings, and the selection of the proper kind to use is important. Bird & Son, East Walpole, Mass., manufacture the Neponsit Sheathing Paper, and they will send samples and catalog to any builder.

39. **The Use of Redwood** for architectural and building uses is described in booklet No. 5, issued by The Pacific Lumber Co., 2070 McCormick Building, Chicago, Ill. This booklet will be sent to interested parties, whether intending home builders or contractors.

40. **Window Installation Costs** can be greatly reduced by the use of the Anderson Window Frame. A valuable book for builders on this subject will be sent by the Anderson Lumber Co., Dept. F-1, South Stillwater, Minn.

41. **Small Kitchens** can have all essential furnishings in a small space if properly arranged. To meet this need kitchenette equipment is made by the La Grange Fixture Corporation, La Grange, Ind. They have an interesting catalog, which will be sent any one interested.

42. **Tile Composition Flooring** is described in the catalog of the Corkstone Products Co., 539 N. Wolfe Street, Baltimore, Md. This flooring is suitable for bathrooms, kitchens or porches and halls in houses, as well as for stores and public buildings.

43. **Concrete Mixing** on the job is best done by having a good power mixer. The Little Whirlwind Mixer Co., 438 Gould Street, La Crosse, Wis., have an instructive circular describing their Whirlwind mixer.

44. **Mortar Colors** bring out the full beauty of brickwork if the right kind is selected, such as are manufactured by the Clinton Metallic Paint Co., Clinton, N. Y. They will be glad to send a color book and specifications to any one interested.

45. **Kidders Hand Book** for Architects and Builders has just been issued in its 17th revised edition. It is now more than ever a reliable reference book of useful data and tables regarding every branch of the building industry, both in materials and methods of construction. Professor Thomas Nolan of the University of Pennsylvania is the Editor in Chief. This new edition contains 1,907 pages and is exceptionally well illustrated, bound in leather with gold edges. Price, $7.00—published by John Wiley and Sons, New York.

46. **Increasing Closet Capacity** means saving valuable space. The Knape & Vogt Mfg. Co., Grand Rapids, Mich., will send an illustrated catalog of their system of garment care that can be installed in old as well as new houses. Builders can give their customers more room in less space by its use.

47. **Weather Strips and Screens** are needed for doors and windows. The Victor Parting Bead Co., Reading, Pa., have an interesting circular describing their weather strip, which allows for expansion and contraction.

1922 "Own Your Home" Exposition

THE Executive Committee of the Fourth Annual "Own Your Home Exposition" has announced that the show will be held in the 69th Regiment Armory, New York City, Lexington avenue and Twenty-fifth street, from April 22 to 30, 1922.

It is believed that the downtown location of the Show this year will draw even greater crowds than attended uptown last year. Every phase of home planning, financing, building, equipping, furnishing and landscaping will be shown on the Exposition floor in an effort to encourage thousands of harassed rent payers of New York and its vicinity to either start building at once or join a savings and loan society and start putting the nesessary money aside.

Cleveland Building Show

FAILURE of the city to have its new $6,000,000 auditorium ready in time has caused the postponement of the American Building Exposition, Cleveland, from January 4th to February 22nd. It will cover a period of 11 days, terminating March 4th. Home, commercial and factory building and equipment will be featured.

BUILDING AGE

AND

THE BUILDERS' JOURNAL

NEW YORK, FEBRUARY, 1922



Can a "Box" House be Artistic

Here Are a Few Excellent Examples of What Can Be Done to Obtain a Pleasing Exterior Design

HOUSES lacking good design are the fault of the designers. Artistic designs are possible for the plain rectangular houses that are referred to as "packing box" architecture; far too many awful examples are to be seen in nearly every community.

Now there is no reason why a "box" house cannot have a pleasing appearance and in this issue are shown several examples of good design. It all lays in the proper selection of material, the arrangement of doors and windows, roof projection, porch treatment, etc. Take these little features away and we have nothing left but a "box."

A careful study of the designs shown in this issue reveals the important part that little features play in producing good looking houses.

A square or other rectangular house is favored by many, they cost less to erect and keep warm. They give the maximum amount of floor area for the minimum amount of exterior wall. The trouble has been that such structures have usually been devoid of all beauty.

The pleasing house design shown above is nothing more nor less than a box, yet how different it appears. Note particularly the round dormer, it is something different. The two upper windows—the shutters make them appear wider, and the flower boxes on brackets add just a touch of ornament.

The bay window breaks the flat wall surface besides forming a striking interior feature. The front entrance porch is dignified and pleasing and the side pergola covered porch takes away from the square look. Note how the wall surface has been broken by the introduction of a belt course. All in all we have here a very artistic "Box" house.

Well Arranged Brick Home

The House Shown on the Front Cover is an Excellent Example of a "Box" House With an Artistic Exterior

BRICK lends itself very pleasingly to a Colonial house of square design and the home shown here is the residence of Mr. Alexander C. Shand, built at Narbeth, Pa., from plans prepared by Messrs. Wallace & Warner, architects of Philadelphia, Pa.

The principal feature is the colonial doorway with its sidelights, through this one enters direct into the living room.

The sills of the windows are of white marble and the lintels are of brick set on edge in flat arch form. The first floor windows have solid paneled wood shutters and those of the second floor have movable slat shutters.

Ornamental lattice flank each side of the front entrance and fill up the large brick spaces, there is also a similar lattice between the front window and right hand side of the house.

The side porch is supported by plain, round Colonial columns, the porch floor is of cement topping on a concrete base. The roof of the porch is covered with canvas and forms a balcony which is railed off with a pleasing diagonal design rail.

The outside brick chimney forms a well marked feature of the entire design. The hipped roof has its overhang well proportioned. Wood shingles have been used as the covering, although other kinds of roofing would have served the design just as well. The outstanding feature of the roof are the twin dormers in front.

All the trim including gutters and leaders are painted white, this contrasts effectively with the red brick, and the shingles are stained moss green. One can imagine the pleasing appearance presented by the house in its setting of green grass and trees.

The interior is very conveniently arranged for the needs of a small family. Living room, dining and kitchen are on the first floor, three bedrooms and bath on second floor and two extra rooms can be finished off in attic.

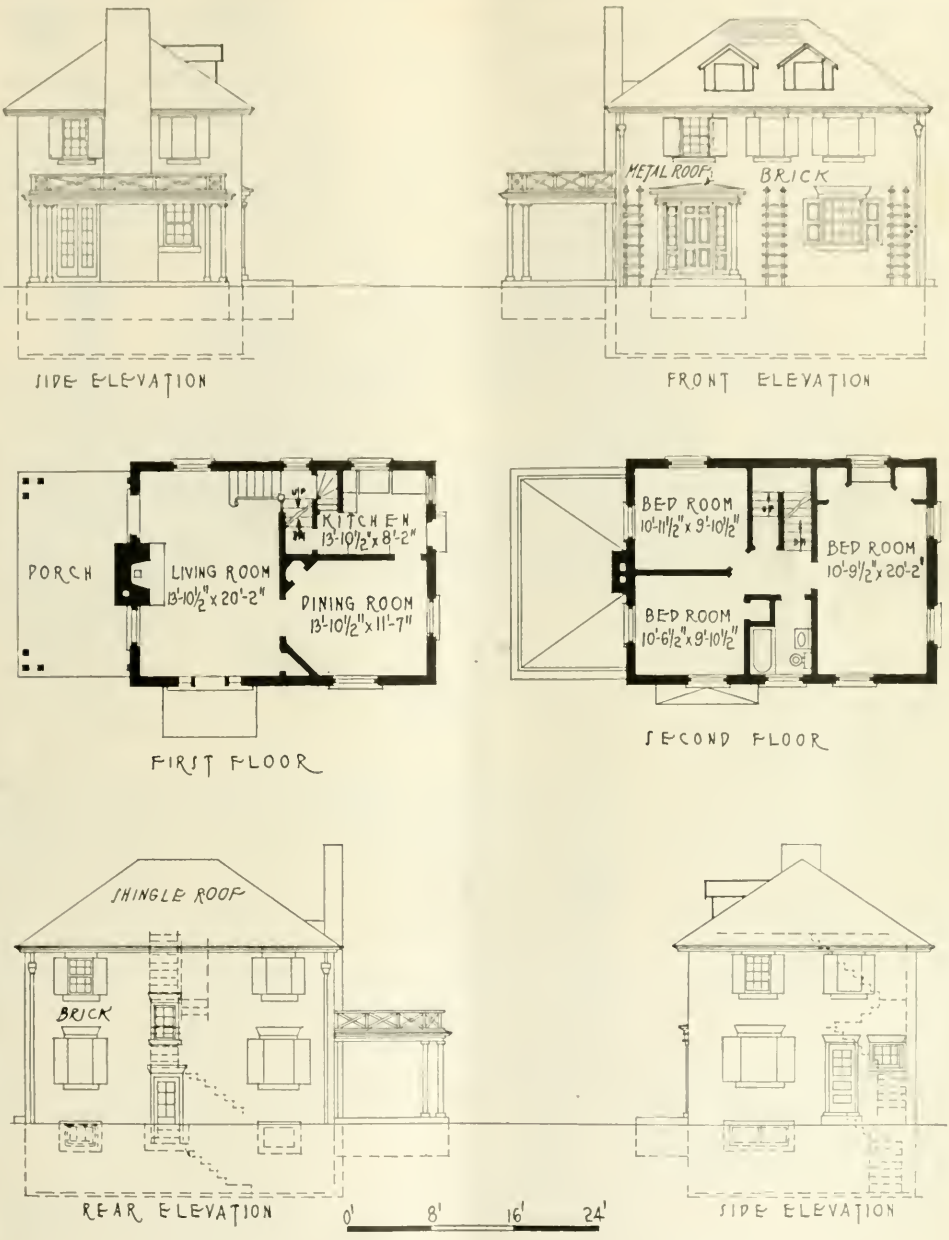
One enters the living room direct from the front entrance; at the right is a coat closet. At the rear is a stairway of Colonial design, this leads to a platform from which one descends to the kitchen; this arrangement enables the housewife to go upstairs from the kitchen without going through the living room.

At the left side of the living room there is an open fireplace with a Colonial mantel. French doors open to the side porch which really forms a sort of out door living room.

The dining room has a corner china closet in true Colonial style with door having semicircular top, the other side is slanted off the same distance so as to correspond.

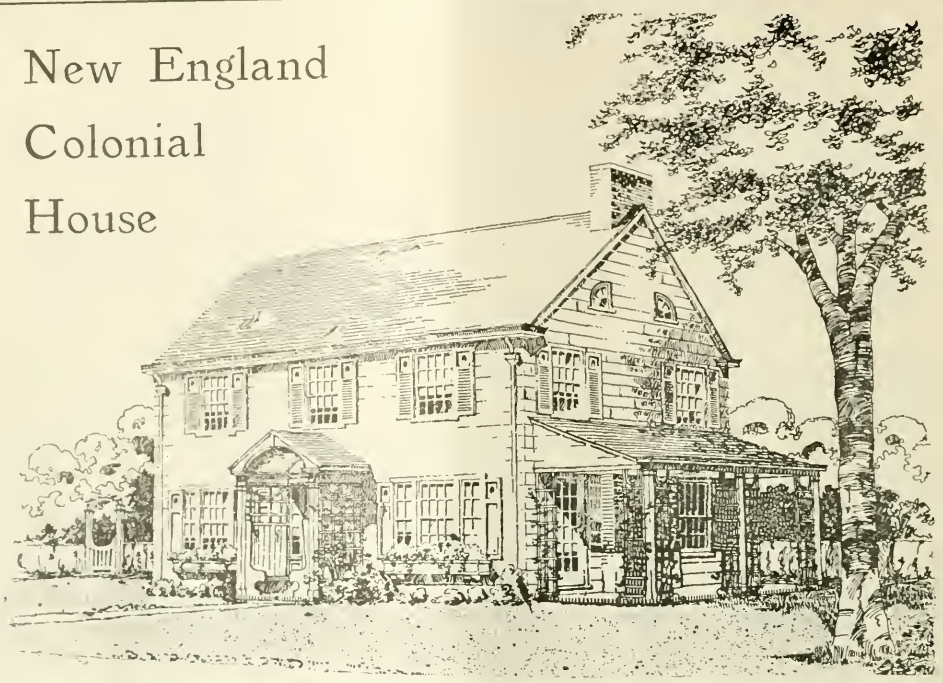


Wallace & Warner
Architects
Philadelphia, Pa.



Plans and Elevations of Brick House Shown on Front Cover

New England Colonial House



FOR those who like the New England Colonial type—and this type is rich in possibilities for refined houses along simple, dignified lines—the house shown herewith will at once offer a strong appeal. It is another example showing that a "box" can be made attractive.

The broad straight front, unbroken roof, delicate entrance porch with benches and lattice, large windows divided into small panes with heavy muntins and, last, but not least, the finely detailed entrance doorway—all reflect the old Colonial spirit of New England.

The outside walls are covered with heavy shingles laid with wide exposure and finished in the old "whitewash" effect, while the roofs, which are also shingle, are stained a rich moss green. The blinds and shutters should be finished in a Colonial blue, the chimney painted white with a black cap.

The above scheme gives a very striking effect in contrast with the green lawns and the planting, and a house thus finished always appears neat and refreshing. Of course where preferred wide clapboards may be used.

Having considered the exterior in detail and—by the way—we must not forget that an attractive exterior counts for much, since to most people our house is viewed only from the outside, we enter in, where we must live and entertain our friends.

The interior carries out the simple refined treatment suggested by the exterior; the house is Colonial throughout. The ceilings are moderately low, giving a cozy and homey atmosphere to the rooms.

A central hall with a large living room on one side and the dining room, kitchen and pantry on the opposite side, are found on the first floor.

The second floor shows a very convenient arrangement with three good sized bed rooms, a bath and abundant closets. An alcove room is also provided which connects with the hall and one of the bedrooms. This little room can be used for a variety of purposes; a sewing room, a child's room, a writing room, or it could be used in conjunction with the hall as a retiring room or lounge and fitted up very attractively with sofa, chairs and the like.

A cellar is provided under the entire house; in which there is ample room for the laundry, heater, coal storage, etc. In the vicinity of New York this house can be erected in first class style for about $8,500.

We give opposite a complete itemized bill of materials required for the erection of this house. Complete plans and specifications of this New England Colonial Home will be furnished for a nominal sum by BUILDING AGE and THE BUILDERS JOURNAL.

Specially Designed for
BUILDING AGE
and
THE BUILDERS' JOURNAL
by R. C. HUNTER & BRO.
Architects New York

Quantity Survey of New England Colonial Home

Shown on Preceding Page

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc Minor outs have been disregarded.

Such items as clearing site, temporary work and protection, scaffolding and general equipment and supplies, have not been included.

Such items as are marked "Unit," are to be estimated in a lump sum, following requiremnts of plans and specifications.

EXCAVATION

(Excavation for pipe trenches not included)

Excavation for cellar.....207 cu. yds.....
Excavation for footings ..... 14 cu. yds.....
Excavation for areas .... 8 cu. yds.....
Excavation for trench walls .....16 cu. yds..
Excavation for leader drains and dry wells .....15 cu. yds..
Backfilling around walls, etc.....40 cu. yds..
Leader drains and dry wells
Field stone for dry wells .....11 cu. yds..
4" salt glazed tile drain pipe..... 42 lin. ft..
4" elbows .....7..

MASONRY

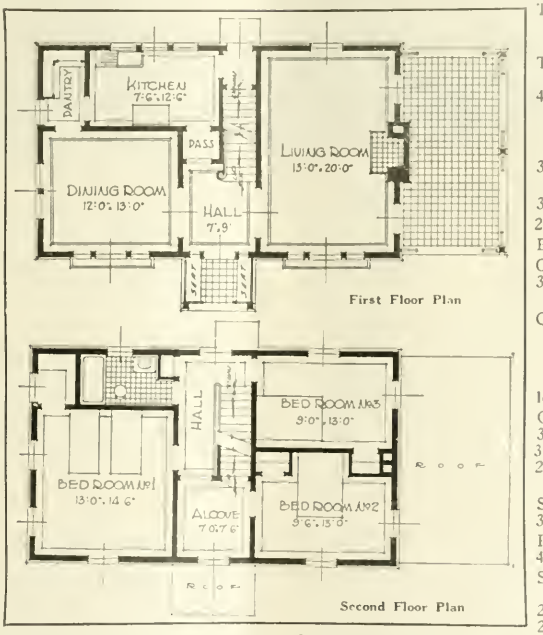
Concrete work
Concrete for cellar walls .....826 cu. ft.
Concrete for footings .....253 cu. ft..
Concrete for trench walls ...260 cu. ft..
Concrete for area walls ..... 55 cu. ft..
Cellar floor (3" concrete and 1" cement finish...657 sq. ft..
Area Bottoms (brick and sand) 40 sq. ft..
Porch floors (12" cinders, 3" concrete and 1" cement finish, colored and blocked off ..... 12 sq. ft..
Same with common brick in place of cement finish .....235 sq ft
Concrete forms..... .2,500 sq. ft
Pointing cellar window sills.....20 lin ft

BRICK WORK

Common brick work for chimney.. .....205 cu ft
(or 10 M.)
Face brick for hearth and jambs.... ... 20 sq. ft.
(or 140 brick)
Fire brick for fireplace..... 22 sq. ft
(or 110 brick)
8" x 12" T. C. flue lining..... 60 lin ft
3" bluestone chimney cap... .....1 unit..

MASON'S IRON WORK

Fire place damper (3'-4" opg., with throat, etc.) .....1 unit..



C. I. ash dump..... .....1 unit.....
C. I. cleanout door for ash pit (12"x16").....1 unit.....
C. I. cleanout door for boiler flue (8"x8") .....1 unit.....
Thimble for boiler flue (9" dia.) .....1 unit.....

PLASTERING

Three coat patent plaster on wood lath, gross .....651 sq yds.
(Net 590 sq yds.)
G. I. corner beads..... 60 lin ft.....

TILE WORK

Tile work for bath rooms
Floor (1" hex. white)..... 30 sq. ft.....
Wainscot (3"x6" white wall tile).....140 sq. ft.....
6" sanitary base ..... 18 lin ft.....

SHEET METAL WORK

Tin roof on dormer..... 64 sq ft.....
Tin flashings for roofs, etc..... 40 lin. ft.....
Tin flashing for column caps..... 5 caps.....
Tin flashing and counterflashing for chimney... 10 lin ft..
Tin gutter lining (20" wide)..... 80 lin ft..
4" half round hanging gutter (No. 24 gauge galv. iron)..... 21 lin. ft..
3" half round hanging gutter.. 11 lin. ft..
3" tin leaders..... 84 lin. ft..
2" tin leaders..... 18 lin. ft..
Bends for same.....12..
Gutter thimbles..... 8..
3"x4" galv. iron gas range vent.. 22 lin. ft..
Cap and thimble for same..... 1..

CARPENTRY

All 1" common stock, hemlock, rough unless noted.
Cellar girders, 6"10" spc. 3 14 .....210 F.B.M...
3"x10" spc., 1/16. 40 F.B.M..
2"x3" nailer, 96 lin. ft. ..... 48 F.B.M...
Sills, 4"x6" 3/16, 5/14, 1/8. 252 F.B.M...
Posts, 4"x6" 4/18 ..... 144 F.B.M..
Studs, girts and plates first floor 2"x4", 112/10 ... 746 F.B.M..
2"x4", 127/8 ... 677 F.B.M..
Porch col. cores 3"x4", 5/8 ..... 40 F.B.M. ....
Studs,. etc., second floor, 2"x4", 260/8 ... ...1380 F.B.M.....
First floor joists 2"x6", 49/14..... ... 1140 F.B.M.....
Second floor joists 2"x10", 49/14..... 1140 F.B.M.....
Living porch ceiling beams 2"x4", 17/10. 114 F.B.M.....
Third floor joists 2"x6", 46/14..... 644 F.B.M.....
Living and ent. porch rafters 2"x6", 18/10 180 F.B.M .....
Plates 4"x6", 4/10; 3"x8", 1/10 ..... 90 F.B.M.....
Rafters 2"x6", 76/14..... 1062 F.B.M .....
Ridge 2"x8", 3/12..... 48 F.B.M.....
Floor bridging 2"x3", 400 lin. ft..... 200 F.B.M.....
Cellar partitions 2"x4", 13/14.. ..... 122 F.B.M.....
Sheathing (⅞"x8" shiplap)
Walls to cover .....2200 sq. ft.....
Flat roofs to cover ..... 50 sq. ft ....
Sheathing paper (waterproof) .....2300 sq. ft .....

Shingle lath, 7/8"x3" ..... 2850 lin. ft.
Grounds, 3/4"x2" surfaced one side ..... 2000 lin. ft.
Sheathing for cellar partitions (7/8"x8" shiplap) to cover ..... .160 sq. ft.
Rough flooring (7/8"x8" shiplap)
First floor to cover ..... .680 sq. ft.
Furring (7/8"x2") ....150 lin. ft.
Shingle roofs (18" stained shingles)
128 squares ....8900 shingles
Shingle sides (24" stained shingles)
17 squares ..... .5500 shingles

EXTERIOR FINISH

Watertable (7/8"x2" strip) ..... .114 lin. ft.
Main Cornice
7/8"x6" soffit ..... .80 lin. ft.
7/8"x4" fascia ..... .80 lin. ft.
3" crown mould ..... .80 lin. ft.
3" bed mould ..... .80 lin. ft.
Dormer Cornice
7/8"x4" fascia ..... .20 lin. ft.
7/8"x6" frieze ..... .48 lin. ft.
2" mould ..... .20 lin. ft.
2" bed mould ..... .20 lin. ft.
Ent porch finish
6"x6" box cols. 8'0" long with cap and base 2
Lattice panels, 4'6" long x 8'0" high 2
Portable benches, 4'6" long, 5'0" high 2
3" crown mould ..... .10 lin ft.
3" moulded fascia ..... .26 lin. ft.
2" bed mould ..... .34 lin. ft.
7/8"x6" frieze ..... .48 lin. ft.
7/8"x6" soffit ..... .36 lin. ft.
2" neck mould ..... 24 lin. ft.
Front fascia with key block 1
5/8"x7/8" cove ..... .40 lin. ft.
5/8"x2 1/4" M. & B. ceiling to cover ..... .42 sq. ft.
Compo. rosettes ..... .9 units
Living porch finish
6"x6" box cols., 8'0" long with cap and base ..... 3 units
Lattice panels, 1'6" wide x 8'0" high ..... 8 units
7/8"x6" soffit ..... .80 lin. ft.
7/8"x4" fascia ..... .80 lin. ft.
5/8"x7/8" cove ..... .50 lin. ft.
1 1/4" rake mould ..... .22 lin. ft.
5/8"x2 1/4" M. & B. ceiling to cover ..... .200 sq. ft.
Rear porch finish
1 1/2" mould ..... .12 lin. ft.
5/8"x2 1/4" M. & B. ceiling to cover ..... .16 lin. ft.
Cellar bulkhead
7/8"x4" M. & B. ceiling to cover ..... .50 sq. ft.
7/8"x6" fascia ..... .20 lin. ft.
5/8"x7/8" cove ..... .14 lin. ft.
Windows: Frames complete with sash, outside trim, etc., sash 1 1/2" thick, glazed D. T.
Cellar Windows
Single top hung casem. sash, 3'0"x2'0" 4 light 4
Mull. sash ea. 2'6"x2'0" 4 light 1
First floor windows
Single D. H. sash, 3'0"x5'0" 16 light 2
Triplet D. H. sash (1) 3'0"x5'0" 16 light 1
(2)—1'8"x5'0" 8 light 2
Single D. H. sash 2'6"x3'2" 12 light 1
Mull. D. H. sash ea. 2'6"x3'2" 12 light 1
Triplet D. H. sash ea. 2'6"x3'2" 12 light 1
Second floor windows
Single D. H. sash 3'0"x4'4" 16 light 10
Single D. H. sash 2'6"x3'2" 12 light 1
Third floor windows
Single D. H. sash 2'6"x3'2" 12 light 1
Single hinged semi-circular 3'0" dia 1
Single hinged quart. circular 1'8" 2
Shutters (1 1/8" thick solid paneled)
3'0"x5'1" pr. ..... .2 pr.
2'6"x3'3" pr. ..... .5 pr.
3'4"x5'1" pr. ..... .2 pr.
3'0"x4'5" pr ..... .2 pr.
Blinds (1 1/8" thick fixed louvres) 3'0"x4'5" pr ..... 8 pr.
Exterior door frames (1 3/4" thick rabbeted) Complete with outside trim
Front entrance, door 3'0"x7'0", sidelight sash 1'0"x5'0" panels below, trim, etc. ..... 1 unit
Frame for door to living porch 2'10"x7'0" 1
Frame for rear entrance door 2'8"x7'0" 1

Exterior doors (all to detail)
Front entrance door, 3'0"x7'0"x1 3/4", 6 panel 1
Door to living porch 2'10"x7'0"x1 3/4" glazed D. T. 1
Rear door 2'8"x7'2"x1 3/4" glazed D. T. 1
Finished flooring
Living room, dining room, ent. hall, plain sawed white oak, 13/16"x2 1/4" to cover ..... 480 sq. ft.
Kitchen, pantry, etc., No. 1 maple 13/16"x2 1/4" to cover ..... 152 sq. ft.
Second story No. 1 C. G. Y. P. 7/8"x2 1/4" to cover ..... 630 sq. ft.
Third story N. C. Pine 7/8"x4" to cover ..... 630 sq. ft.
Lining paper under floors ..... 700 sq ft.
Cement filled pipe cols. in cellar (4" dia. x 7'6" long with caps and bases) 6
Joist hangers (1 1/4"x2" W. I.)
For 2"x10" beams 6
For 4"x10" beams 4

INTERIOR FINISH

Door trim (whitewood)
7/8" jambs, 1/2" stops, 7/8"x4 1/2" moulded and mitered trim with wall moulding.
For doors 2'6"x6'8" ..... 8 sets
For doors 2'4"x6'8" ..... 5 sets
For doors 2'0"x6'8" ..... 1 set
Trim for inside of exterior doors
Front entrance with sidelights, etc. ..... 1 set
Rear entrance 2'8"x7'0" ..... 1 set
Door to living porch 2'10"x7'0" ..... 1 set
Trim for cellar doors (plain) ..... 1 set
Trimmed openings finished same as for doors
Opg. 5'0"x6'8" ..... 2 sets
Arch opg. to hall with trim, opg. 2'8"x7'0" ..... 1 set
Windows (whitewood)
7/8"x4 1/2" moulded and mitered trim with wall moulding. 1/2" stops. 1 1/8" moulded stool. 7/8" moulded apron, 5/8"x7/8" cove under stool.
For windows, single, 3'0"x5'0" ..... 2 sets
For windows, triplet, (1) 3'0"x5'0"; (2) 1'8"x 5'0" ..... 2 sets
For windows, single, 2'6"x3'2" ..... 3 sets
For windows, mullion, 2'6"x3'2" ..... 1 set
For windows, triplet, 2'6"x3'2" ..... 1 set
For windows, single, 3'0"x4'4" ..... 10 sets
For windows, single, half circle, 3'0" dia ..... 1 set
For windows, quart. circle, 1'8" ..... 2 sets
Base. 7/8"x6" moulded ..... 470 lin. ft.
7/8"x4" plain (closets) ..... 45 lin. ft.
2" base mould ..... 470 lin. ft.
1/2" quarter round floor moulding ..... 520 lin. ft.
Picture moulding (7/8"x2 1/4") ..... 400 lin. ft.
Chair rail in living room (7/8"x3 1/2") ..... 70 lin. ft.
Mantel for living room ..... 1 unit
Interior doors (2 cross panel birch veneer)
Door 2'6"x6'8"x1 1/2" 8
Door 2'4"x6'8"x1 1/2" 5
Door 2'0"x6'8"x1 1/2" 1
Solid pine cellar doors
Door 2'6"x6'6"x1 1/2" 1
Whitewood doors
Door 1'6"x3'0"x1 1/8" 1
Closet shelving (7/8"12" pine) ..... 25 lin. ft.
Hook strip (7/8"x4") ..... 40 lin. ft.
Rabbeted shelf cleat ..... 18 lin. ft.
1" dia pipe clothes rod ..... 12 lin. ft.
Pantry cupboard (front 6'6"x8'0")
Countershelf, drawers, doors, etc. ..... 1 unit
Main stairs first to second story
14 risers 3'0" wide, semi-caged, starting newel, turned balusters, balustrade at second floor, etc. (whitewood) ..... 1 flight
Cellar stairs, 12 risers, box patterns, yellow pine, wall hand rail, etc. ..... 1 flight
Stairs, second to third floor
12 risers, box type, yellow pine, balustrade at third floor, etc. ..... 1 flight

GENERAL CONDITIONS

Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges.

Allow for general work not listed, such as grading, planting, etc.

Include sub-bids: Hardware and applying same, painting and decorating, plumbing and gas fitting, heating, electric work.



Artistic Cottage of Stucco and Shingles

Interesting "Box" Design by Schermerhorn & Phillips, Architects

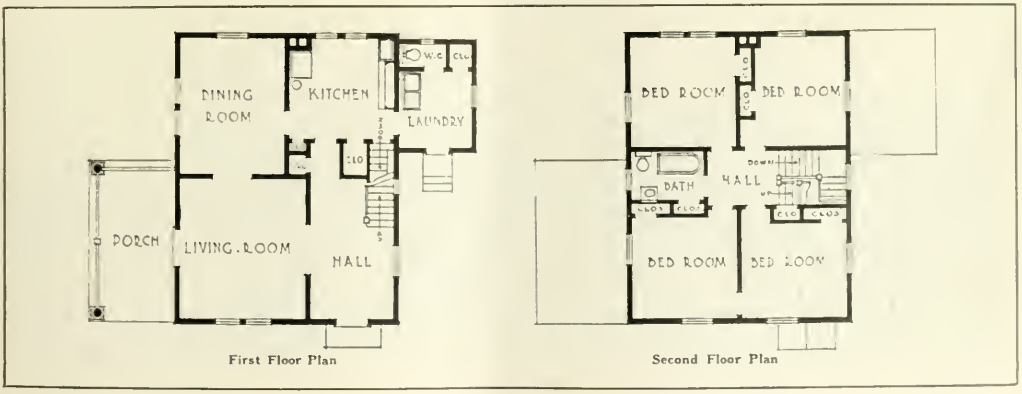
THIS small home will appeal to those who like a "box" type but want something distinctive and artistic in design. It was built at Willow Grove, Pa.

In this house the architects have added the little touches that lift it out of the ordinary—note the hooded entrance, the porch treatment, the gable, etc. Using stucco for the first floor and shingles above gives a pleasing contrast.

The rooms have been grouped for convenience. One can enter the living room from the porch. There is a large reception hall connecting with living room and entered from the front door. A coat closet is conveniently reached from the reception hall.

A separate laundry extension on the right side is an innovation as it will have more uses than just for mere laundry work—it serves practically as an enclosed side porch.

The bedroom arrangement is very convenient—each room being provided with a closet. All bedrooms and bath open from a square central hall. The attic contains two large rooms.



HOW TO ESTIMATE BRICKWORK

Practical Pointers on Figuring Quantities and Labor

By WILLIAM CARVER, Architect

NO thoughtful person can fail to be impressed by the tendency among the building public to turn more and more from the perishable type of construction now generally used and to demand more enduring buildings, which save much in upkeep and in fire insurance premiums, are cooler in summer and assure the thriftiest use of fuel in winter, preserve their market value indefinitely and are a better investment. This movement is also in line with the urgent necessity for stringent conservation of our forest products, as made evident by the Senatorial investigation last year and by the present extensive agitation for reforestation.

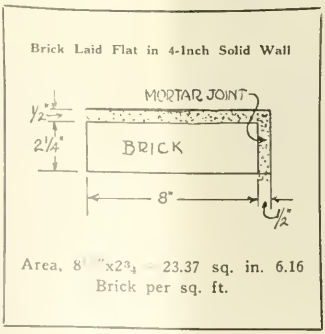
Chief among the better materials to which the public is turning is brick. This is only natural, for brick construction is the standard by which all other types of masonry may be measured. That such-and-such a material is "as good as brick" is a claim often read in advertisements. Its venerable history, its test by actual use under every conceivable condition and during periods up to thousands of years, its characteristic beauty which warms and mellows with the passing years, are reason enough for the general public, in which, after all, there is a strong appreciation of better things, inclining more and more toward this material. Moreover, brick now has its spokesmen who are drawing the attention of the people to the advantages of brick construction in the advertising pages of innumerable magazines and newspapers.

A contractor who is acustomed to turning out buildings on non-permanent construction and who tries to dissuade a customer from building a brick home by giving offhand an almost prohibitive figure for its construction, is making a great mistake. If he succeeds in his attempt to build a less enduring building, it will be borne in upon the purchaser more and more as time goes on that his reasons for wanting a better home were correct and the reputation of the builder will suffer. Satisfied customers, in any line, are the basis of success. The wideawake contractor is now making



himself familiar with methods and details of all types of permanent construction. He is learning that, after all, the estimating and building of masonry structures is no more difficult than is dealing with the construction with which long use has made him most familiar.

In giving a rough estimate of the comparative costs of a house in two or more types of construction, the



contractor should remember that the great majority of the work in the house will cost exactly the same, no matter whether the house is of brick, frame or any other construction. The foundation walls, chimneys, floors, partitions, millwork, roof, wiring, plumbing, heating, tinwork and many other items will show the same cost, the only difference being in the exterior enclosing walls, and that only above the first floor line. Data gathered by the American Face Brick Association from various sections of the country over a number of years, indicates that the total cost of a brick house averages only about 7% over the more ordinary type of construction, a difference of only $350 on a $5,000 house. It may be noted here, however, that the new brick Ideal wall, developed in recent months, reduces the cost of a brick house to such an extent that it can now compete in price with many forms of construction, but for the present we will figure the old type of brick building.

The carpenter contractor who would equip himself with information so that he can readily figure brick construction should be warned, however, that too many small mason contractors use estimating methods that are out of date and inexact.

Of course, on a small job, an error or inexactitude in taking off quantities may not be a serious matter, but on larger work or where figuring is close, the contractor should have a system so that exact costs and definite profits can be figured and thus eliminate uncertainty as far as it is possible to do so. To illustrate,—some mason contractors figure 7 to 7½ bricks per square foot of four inch wall thickness of solid brick wall. Anyone who will take the trouble of figuring out the square foot area of a standard brick (which is 2¼"x3¾"x8") plus the usual ½" mortar joint, will see that it is impossible to get more than 6.16 brick per square foot of area, especially in view of the fact that there is practically no waste when using brick. Every bat and broken brick can be used in the wall. On a large job, the cumulative effect of

this error would be serious and would result in the ordering of about 16% more brick than needed, not to mention the figuring in of items for handling and laying the extra brick and the cost of extra mortar. There is a similar unfortunate practice often followed when figuring openings, some contractors deducting only a certain proportion of the area of the wall figured as solid, the theory being that the extra amount of brickwork figured in will pay for the cost of forming the opening. A better way than this is to deduct the full area of each opening, including the space occupied by the window box for a double hung frame, and make a definite allowance for forming the opening. Similarly, some contractors do not deduct openings of less than a certain area—sometimes ten square feet, but it is easily seen that this practice would result in considerable inaccuracy on a job where a number of such openings occurred. The full thickness of the wall is also frequently figured for the full girth of the building; and again, in this case, the theory is that this gives an allowance for the extra cost of forming the corners. It is apparent that in a four cornered building, with an eight-inch wall, a length of thirty-two inches times the height of the wall is thus figured in excess of the actual quantity of material and labor required.

The modern way of estimating brickwork is to figure the actual amount of brick, mortar, etc., needed and base the estimate upon a unit cost which will cover the forming of the openings and corners shown on the drawings. Very few buildings are constructed with plain walls without any openings, and the rate of laying



A Corner of House with Ideal Wall

brick is always averaged from jobs on which the usual number of openings occur. The best method is, therefore, to first look over the plans and specifications to determine the class of workmanship desired, the bond, joint and kind of mortar in which the brick is to be laid, whether or not the usual number of corners and openings are shown and fix the unit cost accordingly. Special items requiring extra labor can then be added as necessary.

Some contractors take off quantities of brickwork by reducing all the work where footings go to various brickwork to cubic feet and for larger depths, where walls vary in thickness and where the brickwork is in irregular masses, this is probably the best method.

On smaller buildings, such as residences, where most of the brickwork occurs in walls of two thicknesses only (apart from chimneys and porch piers) it is generally more convenient to determine the area of the walls of each thickness and either to multiply these areas by the number of brick required per square foot or to read off the quantities from tables which are now available.

Another matter upon which practice varies is that of determining the number of face brick—where such are used—and their increased cost over the cost of the common brick backing. Some contractors determine the number of common brick and face brick separately, figuring the cost at different unit prices. Others figure the entire wall as a common brick wall, adding the increased cost of the face brick and the laying of the same as an extra item. The latter is probably the best method and makes for simplicity and accuracy in figuring. Where the face brick are bonded into the backing with headers, these should, of course, be allowed for in addition to the brick in the outer course.

In actually figuring a job a form is used which is ruled to denote the "in" items on one side and "outs" on the other. The square foot areas of the exterior wall 8" thick above the first floor line would, for instance, be placed under the "in" heading, while under the "out" heading would appear the areas of the window and door openings. The brickwork displaced by stone trim, by the weight boxes of double hung windows and other such items should be allowed for and material and labor deducted for the same. In the "in" column, however, is included any extra material and labor necessary for particular items. This system, carried out thoroughly on a few jobs, will enable costs to be determined very closely, especially if a record is kept of the



Erecting a Brick Building with Ideal Wall Construction

actual cost of each item and checked over with the estimate.

In figuring fireplaces and chimneys, the quickest way is first to figure them as solid brickwork, afterward deducting the brickwork displaced by flues, fireplace openings and ash pit. Tables are available for figuring the material in chimneys, also in porch piers, the tables showing the material needed per foot run.

In figuring the labor, it should be remembered that bricklayers are now quite up to their pre-war production. In the data which follow the bricklayer production is figured on a very conservative basis, and from all sections come advice that these production figures can safely be increased.

In figuring an Ideal wall job, no furring or lathing need be included, plaster being applied directly to the brickwork.

Where brickwork is to be cleaned down, an allowance for this item should be made, also for mortar color, foreman where one is employed, and on large jobs the overhead or rental cost of hoisting machinery, engineer's time and fuel for same.

Material and labor for one square foot Ideal all-rolok wall 8" thick: 9.035 brick (of which 6.023 appear upon the face); .08 cu. ft. mortar, .061 hrs. laborer's time; .076 hrs. bricklayer's time.

For one square foot solid wall in common bond: 12.705 brick, .135 cu. ft. mortar, .093 hrs. laborer's time; .084 hrs. bricklayer's time, if wall is laid in lime or cement-lime mortar. Where the mortar is cement mortar a little extra bricklayer's time should be figured for this mortar is a little less plastic. .092 hrs. bricklayer's time per sq. ft. is a fair allowance for cement mortar.

Where the Ideal wall is used the cost of construction of a brick home or other building is brought down so that it can compete on an equal first cost basis with any other construction.

By laying brick on edge instead of flat, a hollow wall is formed which has the important advantage of having no through mortar joint and which has a very slight current of air circulating in the interior. Moisture, even under severe practical conditions, cannot be conducted the length of a header brick by capillary attraction and the slight circulation of air helps to keep the header dry. It is therefore practical to plaster directly on the brick without the use of furring. The Ideal wall is the only type of masonry wall so far developed in which furring can be safely omitted. Practice has proved this wall, plastered directly on the brick, to be entirely satisfactory wherever used.

Will Machine Mixed Mortar Pay on Small Jobs?

By A. NYDEGGER

LIME mortar is one of the oldest known building materials, having been used long before the Christian era. Until very recent years, the ancient method of mixing, namely, with a hoe in a mortar box has survived for many centuries. In fact, it is surprising to note how many contractors are still using this antiquated method even on comparatively large jobs.

In the last few years, mortar mixing machines have been developed for mixing lime and cement mortar which are so practical and which have so many advantages over hand mixing, that one wonders why they are not used universally on every brick job.

One good form of machine is the continuous mix type, consisting of a long trough or drum with a revolving shaft carrying the mixing paddles running thru the center. The slacked lime and sand is shoveled into one end of the drum and the pitch of the paddles acting as a screw conveyor carries the mixture to the other end, thoroughly mixing it on the way. The proper tempering is done while the mortar is in the machine, so that when it is discharged at the far end of the machine into a box or wheelbarrow, it comes out in a smooth, putty-like mass in perfect condition for the brick-layer.

Machine mixed mortar effects a saving for the contractor in many ways over hand mixed mortar. Because of the thorough mix given it by the machine, up to one-third less lime can be used and still produce as strong a mortar.

One man with a machine can mix mortar enough for twenty brick-layers, therefore reducing the labor to less than 25% of that required for hand mixing.

Owing to the smooth consistency of the machine mixed mortar, the brick layers can lay approximately 10% more brick.

During the hottest days of the Summer it is often physically impossible for a laborer to pull a hoe, thus shutting down the brick-layers for lack of mortar. The machine is unaffected by heat and the job is not held up. This of course reduces the contractor's overhead expense, increasing his profit. Furthermore, he can complete his job in less time, enabling him to take on more work and increase his volume of business.

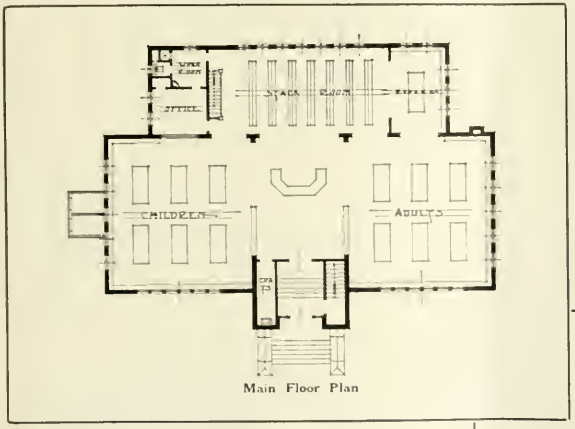
The question often arises as to how small a job it pays to use a machine on. A brick job of three hundred thousand brick will warrant the contractor in purchasing a machine if he does not already own one. After he has the machine, it will pay him to use it on a job of fifty thousand brick or less. Many contractors now using machines claim it pays to use them on two-family flat buildings requiring twenty to thirty thousand brick.

The time is fast coming when contractors as well as manufacturers must cut all the corners possible and take advantage of every possible means to reduce cost of production.

The use of a machine for mixing his mortar will go a long way towards making the mason contractor the successful bidder on a job and insuring him a profit when the job is completed.



Public Library of Gothic Design



Main Floor Plan

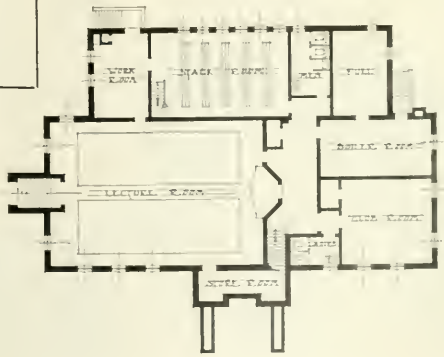
LIBRARY buildings reflect the intelligence of a community; where one sees a good library it is an indication of a good town. Vincennes, Ind., can boast of an artistic public library which was erected from plans drawn by John Bayard, architect, of the same city.

The building is constructed of brick with limestone trimmings, the architecture following the Gothic style. The library proper consists of two reading rooms, one for children and the other for adults, with a stack room and office in the rear addition. The basement contains additional stack space, lecture room and club room, besides toilets and heating plant. The lecture room is reached by a separate entrance direct from the street as well as from the library proper.

The entrance doorway is a beautiful example of Gothic work. The double doors are glazed with leaded glass, as are also the two side lights and transoms above.

The reading rooms are exceptionally well provided with windows. The attendant is at a desk located opposite the central entrance so that a view of both reading rooms, stack rooms, etc., can be had from this central point.

The roof of the building is covered with tile. It is a combination of hip and gable end, as will be evident from the photo.


Basement Plan

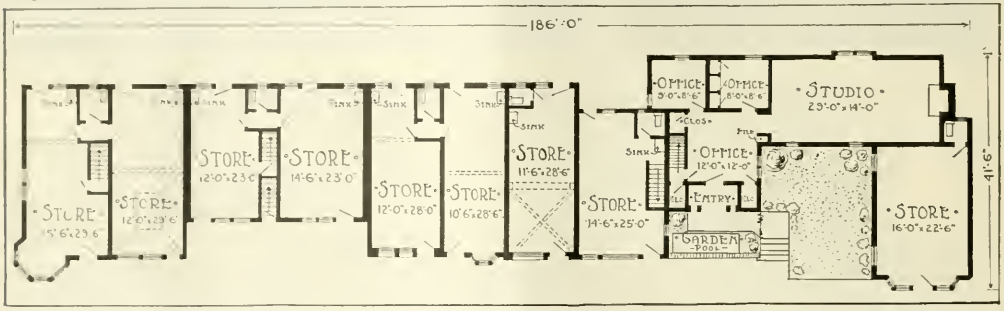


Row of Stores

Novel Bungalow Designs

By CHARLES ALMA BYERS

THE accompanying illustrations show a row of small stores, all joined together in a continuous string, designed to suggest the French village plan. Although they are all built in a solid row, each little shop has its own separate entrance,



and in roof designing and other details appears to have been created as an individual building. In the row are a total of nine stores and one office and studio section, the latter being the place of business of the architects and builders of the string.

The buildings are of frame construction, several of them have their exterior finished with wide redwood siding, while the others have exteriors of cement stucco. The color scheme, as to the walls and trimming, varies. The roofs are of wood shingles, in variagated colors.

The offices and studio of the architects and builders are set back several feet from the sidewalk, and the space thus left in front is carried out in attractive garden style, with a brick-edged lily pond as a feature.

The interior woodwork consists of Oregon pine throughout, which is stained in different colors in the different divisions, and all walls are plastered and attractively tinted. The ceilings are variously designed, some of them being vaulted in different styles and others being flat. Each unit is equipped with sink and toilet, and otherwise made practical and attractive and complete.

A basement extends underneath the entire string, which is partitioned into divisions for each shop.

This string of shops is located in Los Angeles, Cal., and was designed by Pierrepont and Walter S. Davis.



Close View of Two Stores



The Pool Is Unique Feature



The End Store



BUSINESS GETTING METHODS

Ideas that have worked for others

How to Create Building Business

Instructive Advertising Campaign of a Progressive Lumber Company Benefiting Local Builders and Themselves

By J. E. BULLARD

THERE is a vast difference between advertising to the contractor and advertising for the contractor. For seventy-four years the L. Vaughn Co., of Providence, R. I., did the former. A few months ago it began to do the latter.

Established in 1847 this company did no advertising except in such mediums as the "Chamber of Commerce Journal," and the "Builder's Guide," up to 1921 and the advertising it did to the contractors consisted merely of announcement. Yet this company has always done a prosperous business and even though it did build an addition to its plant a couple of years ago there has been a great falling off in building it still could probably get along very well without advertising.

This company, however, though an old company is a progressive company and has observed that during the past twenty-five years jobbers and manufacturers in nearly every industry have been able to increase their prosperity by assisting in building up the business of those to whom they sell. If this has been done in other industries why can it not be done in builders finish?

It is just possible that the falling off in building that has taken place has been due in no small degree to the fact that not so much effort has been given to selling the idea of building and repairs as has been given to selling silk stockings, automobiles and safety razors.

A great many home owners really need only a suggestion to start them remodeling or even building. With these advertisements coming before their eyes there is a constant suggestion to go ahead and build. If no suggestion is made to them, however, they are pretty sure to spend their money for silk stockings, safety razors and automobiles and all the building they will do will be a garage for the automobile. As a matter of fact these days there are far more automobile garages being built than any other kind of buildings and perhaps this is due to the automobile industry using such strenuous methods to sell cars.

In each advertisement the L. Vaughn Co. is running there is a sketch of some product the company sells, and the sketch shows how the product will appear in the home.



How Three of the Advertisements Appeared in Local Papers

Improvement in Construction Industry

Opinions of Delegates at Annual Convention of Associated General Contractors of America. Encouraging Outlook for Business Revival This Year

A DEFINITE assurance that construction recovery is under way and that it is the first phase of a general business revival sums up the results of the construction conference held in Cleveland, January 17 to 19 by the Associated General Contractors of America. Evidence of this fact, both statistical and informal, abounded in the discussion of the delegates and in the papers presented as a part of the program.

Col. Leonard P. Ayres, who was chief statistical officer of the A. E. F. and who is now vice-president of the Cleveland Trust Co., expressed the belief that prices will continue to fall, intermittently, for ten or twenty years more, but conveyed assurance that the construction industry will be immune to many of the embarrassments of the coming period, because it supplies a market in which their is a latent demand equal to 2¼ years normal production of building.

"In other words," said Col. Ayres, construction can go along for nine years at 25 per cent. above normal and only fill the normal demand by the end of that time.

Financial Problems

Col. Ayres said that building finance problems had commenced to adjust themselves, through greater abundance of money. "The acrimonious discussions between yourselves as contractors and ourselves as bankers are about over," he remarked. "Within six months so much money will be for borrowers that owners will be able to arrange building loans on pre-war terms."

Elimination of Waste

Determined not merely to predict prosperity, but actually to observe it, the constructors arranged a program in which the theme of waste elimination was constantly emphasized.

J. Park Channing of Boston, who succeeded Herbert Hoover as chairman of the Federated Engineering Organizations, gave the major paper of the conference on this subject and said that 25 per cent. of the responsibility for waste rests on labor, 50 per cent. on management and the remaining 25 per cent. on outside relationships.

Cost Plus vs. Lump Sum Contracts

Cost-plus contracts, fee contracts and efforts made in some projects to eliminate the general contractor were discussed. D. A. Garber, of New York, voiced the belief that few architects and engineers can qualify to direct a building project in the place of the general contractor. Godfrey Edwards, of Los Angeles, decried anything but lump sum contracts, believing that when a builder takes a job on a cost plus or a fee basis, he is paving the way for his own elimination.

Idealism in Construction

By ARTHUR S. BENT

President Associated General Contractors of America

From Address at Convention

THE industry that we represent is not alone very great; it was the only hope of a shattered world lying almost in ruins only yesterday. Men may fight and destroy for a time, they can build forever, and the very continuity of life itself depends upon construction.

In thinking of our A. G. C. I have wondered if sometimes you thought that I was too much of an idealist. It is a profound truth that no institution can continue to exist without genuine moral worth. If that is true, then the measure of our vitality will be our moral worth. If the A. G. C. should ever stand for being served rather than serving, for having rather than being, for getting rather than giving, then it will cease to achieve any success that will be worth our time and effort.

But that has not and never has been the spirit of this organization, and please God it never will be! Victor Hugo tells us that the world lets everything die that is moved by selfishness, and the reason the A. G. C. is such a lusty young giant tonight is because it is inspired with a spirit of unselfish co-operation between ourselves, a desire to serve our public more worthily and a purpose to lift our craft to higher levels of integrity and honor.

There is a very beautiful legend, an impressive one, I think, so old that its origin is lost—I have never been able to discover it. It goes like this: Four men stood up with God when He made the world, and watched with wonder as the shimmering sphere flung from the fingers of Omnipotence, found the place in the shining galaxy of stars, and one of the men said, "How was it done?" And God said to him, "Go, find out for yourself." And that man went and became a scientist.

And the second man said, "What is it for?" And to him God said, "Go, find out for yourself." And he went and became a philosopher.

"Give it to me" the third begged. And to him God said, "Go, possess it for yourself." And he went out and became the business man.

The fourth said nothing but fell down and worshipped, and God said to him "You too, shall go and because your soul burns within you, you shall create beauty," and that man went and became the artist.

Now may we not, reverently and not unfittingly, add to this noble group of God's journeymen the constructor? We who forerun and always have all the others? We who have straightened the path for their feet? We, without whom their high destinies could not be wrought out and by whom all their visions are crystallized? We work and delve for science in its onward march, and harness its magic to ways of usefulness. The bewildering and marvelous structure through which business functions is the work of our hands. Philosophy leans upon us heavily to demonstrate its theories of life, and even to art we give its tools and make its dreams of beauty imperishable.



Remodeling Residence Into a Store

Interesting Example of Utilizing an Old Brown Stone House for Commercial Purpose

MANY a person has built a residence in a select neighborhood only to find that after a lapse of many years the residential district is gradually giving way to business. In many of our large cities this has often been the case and the owners of the house (usually being people of considerable means), do not care to live in the semi-business neighborhood, therefore, they give up their old residence.

One plan is to tear down the old residence and erect a modern business structure in its place. As the majority of houses are very well built, it is a bigger return on the investment to alter the residence to stores, lofts, or a combination of stores and small apartments. This is being done to a considerable extent in cities like New York, Chicago, Philadelphia, Boston, etc.

The illustration shown on this page are photographs of one of these well constructed brown stone residences located in Philadelphia on Spruce Street. The property was sold to a firm of interior decorators who wanted an artistic home for their business. They turned the commission for the alteration over to C. E. Schermerhorn, Architect, of Philadelphia, and the result of his work is shown in the lower picture. The remodeling follows somewhat along the Roman style of architecture but with Colonial modifications. The result is artistic and was done at a minimum amount of expense.

The two windows on the first floor were cut out and a steel beam inserted so as to carry the upper wall and a triple mullion window was put in their place.

The railing of the balcony was removed but the balcony retained, and this makes a ledge for holding the three Roman design window boxes.

The front "stoop" was entirely removed and the entrance cut down to nearly sidewalk level. The inner vestibule was removed and steps erected leading to the first floor. The original door opening was lowered so as not to have it out of proportion. Above the semi-circular top of the door opening a stone arch was formed, as will be noted by an examination of the lower picture.

Of course, there was considerable alteration in the interior of the house —partitions between the rooms were cut out so as to give ample display room for the new occupants.



MASONRY
Practical Information on Materials and Latest Construction Methods



Elevated House Approaches

By ALBERT MARPLE

ONE of the most difficult things a builder has to contend with is to obtain a good appearance to the approach of an elevated house.

Only the person who has erected a dwelling on a site which is a rod or so in the air knows the real "joys and heart throbs" of home building, at least, of the "elevated" type. This person like no other, also, is able to realize to the fullest extent how "perfectly thrilling" it is to climb from one to a dozen flights of steps, these arranged in zig-zag, criss-cross or circular fashion, about so many times every day, and this, generally, after climbing the long and steep grade from the nearest car line.

It's a safe bet that the person who insists on being able to view the surrounding cities from his basement window, must be willing to smile and shout "Hurrah!" when the thrills of building—and living—upon the top of a hill make their appearance.



An Arrangement That Looks the Best, as It Follows the Natural Slope of the Ground. When Shrubbery Has Grown It Will Look Natural and Form a Very Pretty Picture

There is no type of approach that is so hard to design as is that leading to the "elevated" home, while on the other hand no other kind of approach can be made so attractive by the employment of a little originality. This might consist of the actual shape of the width of the caps to these walls, of the grouping of the flights of steps, etc., in fact, anything that will give that "different" appearance which one should strive after. Yes, this is easier written than done, but generally, a little work will turn the trick.

The rise of the steps of the average approach is about seven inches, while its tread is something like ten inches. This is not a specified size for these steps, however.

To be on the safe side all walls along front of property and the sides of the approach that are over 5 feet high should be reinforced, ½-inch rods will be found of sufficient strength, placing them one foot apart.



House Well Placed, But Too Many Steps in the One Flight—A Better Solution Would Be to Have Several Short Sweeping Flights



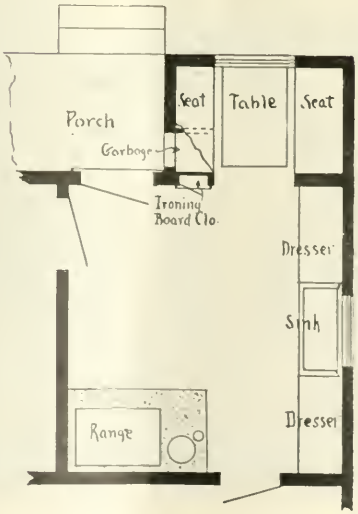
Not a Happy Solution of the Difficult Problem—There is Too Much Stone in Evidence and the Houses Are Too Near the Street Line



Model Kitchen Arrangement

NOTHING pleases a woman more than to have a well arranged kitchen having plenty of cupboards with shelf and drawer room. The picture shown above is that of a very well arranged kitchen and the plan shows the layout. One enters the kitchen from the rear porch, the garbage can may be taken out by opening a little door opening on to this porch and a receptacle is made for it in the space under one of the seats of the breakfast nook, so that it can be reached from kitchen.

This is an arrangement that keeps the garbage can both outside and inside, there is no need for the housewife to go outside in stormy weather, while the garbage can is not in the kitchen. Above this garbage can closet is another shallow closet to contain the ironing board; a convenient electric outlet is the means of attaching the electric iron. Here is a convenience that is so placed so as to receive plenty of light and whenever the ironing board is not needed it is simply folded up and the closet door closed, and it is out of the way. Besides holding the ironing board this closet is deep enough for the iron.

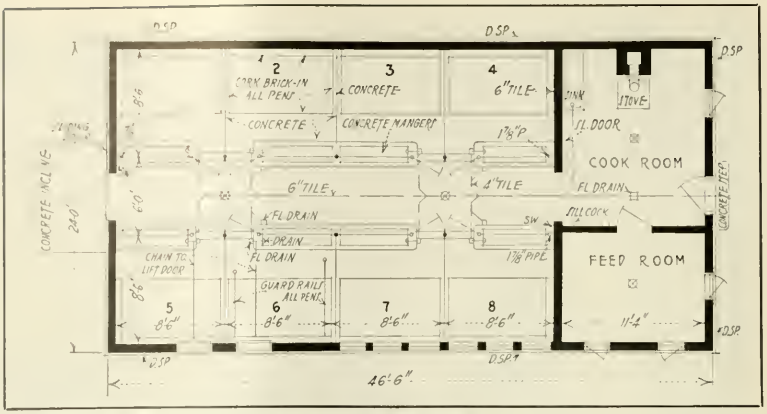


The breakfast nook is suitably arranged. The table may conveniently be used to serve a meal for four persons and during the day time it comes in handy as a place for preparing the meals, peeling potatoes, etc. Notice the electric outlet for the attachment of the electric toaster, grill, percolator, etc. A window a little above the level of the table affords plenty of daylight and a lamp on the ceiling affords the artificial light.

The sink is placed on the right hand side and it is set at a convenient height for the housewife with a large window above it. On each side is a drain board, both sides having cupboard below. A number of drawers are arranged so that there will be plenty of space to keep various kitchen utensils. Above each drain board and table there are cupboards, one on each side of the sink. These extend to the ceiling and afford convenient places for the various dishes, etc., that the careful housewife cherishes.

A range is conveniently placed in the corner where it receives ample light. A refrigerator is placed in the hallway leading to the cellar stairs.

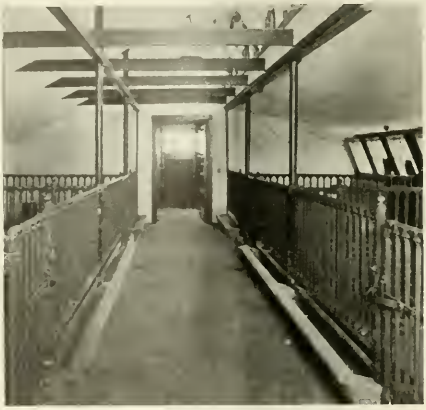
Artistic and Practical Hog House



ONE would hardly expect a hog house to have an exterior design that would have any architectural merit, but here is one that is artistic as well as practical.

This interesting hog house is located on the Morse Farm at Libertyville, Ill. It is built of hollow tile and stuccoed, and the interior of the blocks are also covered with cement plaster.

Below the window line 8-inch blocks are used and above 6-inch, the interior wall being flush, the offset being on the outside—a little feature that adds greatly to the appearance. Ornamental lattice on the front also enhances the beauty of the design.



Interior View, Showing Arrangement of Pens—Concrete Mangers Easily Reached Make Feeding Easy

The roof is of shingles except on the flat section which is covered with a prepared roofing. Rafters are of 2x4", covered with sheathing boards laid close and having sheathing paper under the shingles. The underside of the rafters is covered with metal lath and plastered.

A picture of the interior shows iron pen railings also concrete mangers. There is a concrete floor throughout, in the pens, a recess in the concrete floor is filled with cork brick, everything for comfort and health of prize porkers.

Other interesting details will be noted by an examination of the plan and picture.



An Unusual Design for Factory

CINCINNATI, Ohio, can boast of one of the finest factories in the world. One usually associates a factory with some sort of a dingy looking, prison-like affair, but there are very many excellently designed factories in most of our industrial towns, but most of these lack the picturesqueness that is found in the factory of the Gruen Watchmakers' Guild of Cincinnati.

The proprietors of this watch factory have been very successful in their line of business, and their one idea in building this factory was to make it comfortable for the workmen, as they firmly believe that contented workmen are the finest tools of the factory.

This unusual factory is situated on a hill now known as "Time Hill," where it can be seen for miles around, especially from trains coming into the city. The unusual situation allows architectural and landscaping effects which cannot be had where the ground is level. This factory is the result of very careful planning on the part of the proprietors, the architects and builders.

The factory is devoted to the manufacture of high grade watches following Swiss models. To obtain advertising value from the building it was decided to carry out the architecture along Swiss chalet lines. The entire building and its surrounding grounds have been laid out to resemble the Alpine country.



Close View of Factory Annex





Stone Steps to Factory Built For Work and Romance, Too

The factory has a frontage of 150 feet and a depth of 200 feet, with an annex. Its entire construction throughout is fireproof. The walls are of brick, the first story being faced with dark red tapestry brick, ornamated with tiles. Above this the brick walls are stuccoed and half timbered effects introduced. The roof is entirely of green glaze tile.

High up above the roof are the antennae of the wireless station with which the building is equipped, so as to send out the correct time by wireless at certain stated hours. The large factory floors are provided with high windows which give abundance of light, as this is very necessary for watch making.

Entering the factory one is in the reception room, which is attractively fitted up, and passageways radiate from the central room to the various offices of the management. Beyond the office on the first floor, and the balance of the building is given over exclusively for factory space with the exception of a space on the second floor, which has a dining room and its necessary kitchen.

Only where absolutely necessary are dividing partitions used, the balance of the floor being one vast well lit room. The workmen are seated on benches built to follow the walls and face the giant windows. Sufficient space has been allowed in the equipment of the factory so that no workman is crowded, nor are any placed in dark corners.

The central picture presents a general view of the factory. Even on a cold bleak February day it looks attractive and an ideal place to work.

OFFICE and JOB MANAGEMENT

Things the other man has found out that save money



Short Cuts in Estimating

Simple Practical Forms that Save Time and Assure Accuracy

By I. P. HICKS

WE will now present a few practical forms for the use of the contracting carpenter. The prices are left blank so that the estimator can fill them in to suit the time and locality of the work. The system is the main thing, by carefully filling out the form you will have something very useful as well as reliable and it will prove to be a reliable guide in making estimates. It will save much time in figuring, it can always be kept up-to-date as regards prices, and it serves the useful purpose of being a good reminder of all the things to be figured on in making an estimate. It aids very much to shorten the work of estimating and tends to greater accuracy. Fill out the form, use it on your next job and you will be quite sure to like the plan.

ESTIMATING FRAMING BY THE SQUARE

Kind of Work	Size of Timber	Feet Required	Material Cost	Labor Cost	Total Cost
Outside walls	2x4	88			
Partitions	2x4	88			
Ceilings	2x6	96			
Outside Walls	2x6	132			
Partitions	2x6	132			
Ceilings	2x6	96			
Floor joists	2x8	134			
" "	2x10	166			
" "	2x12	198			
" "	2x14	230			
" "	2x16	262			
" "	3x12	294			
" "	3x14	342			
Rafters	2x4	64			
"	2x6	96			
"	2x8	128			
		20" O.C.			
"	2x4	56			
"	2x6	84			
"	2x8	112			
		24" O.C.			
"	2x4	48			
"	2x6	72			
"	2x8	96			

PORCH FLOOR FRAMING

Double Outside Joists and Double Beams of Same Size Over Columns

		18" O.C			
Joists	2x4	120			
"	2x8	160			
"	2x10	200			

ESTIMATING PER SQUARE

Kind of Material	Dimensions	Feet Req'd	Material Cost	Labor Cost	Total Cost
Common Sheathing	8-inch	110			
" "	10-inch	108			
" "	12-inch	106			
Shiplap	8-inch	123			
"	10-inch	117			
Roof sheathing laid 2" space	8-inch	100			
Laid tight	8-inch	110			
Shingles laid	4½-in.	900 Sh			
Hip & valley roof	4½-in.	1000 Sh			
Siding	½x4 in.	132			
"	½x6 in.	120			
Drop siding	8-inch	125			
O. G. Lap	8-inch	120			
Bungalow	8-inch	120			
Stock boards	10-inch	110			
Battens, lin. ft.		108			
Flooring, face	1½-in.	150			
" "	2-inch	140			
" "	2¼-in.	135			
" "	3¼-in.	125			
" "	5¼-in.	118			
Ceiling, face	3¼-in.	125			

ESTIMATING PER LINEAL FOOT
(Except Where Otherwise Stated)

Description of Work	Material Cost	Labor Cost	Total Cost
Outside base, 2 members			
3 members			
Belt course, 2 members			
3 members			
Corner boards with ¼ round 3 members			
Cornice: plancier, fascia, frieze, C & B mold, 5 members			
Porch columns, each			
Porch newels, each			
Porch rail and balusters, per foot			
Porch steps, per foot			
Lattice panels, per sq. ft.			
Gable brackets, each			
Verge boards, per ft.			
Grounds, frame building			
Grounds, brick, tile or concrete building			

TO BE FIGURED COMPLETE IN BUILDING

Description of Work	Material Cost	Labor Cost	Total Cost
Cellar windows, average size			
Cellar doors			
Front doors, stock size			
Grade doors, stock size			
Rear doors, stock size			
Double acting doors			
Sliding doors, double			
Sliding doors, single			
Folding doors			
Inside Main Doors			
Mirror doors			

TO BE FIGURED COMPLETE IN BUILDING
(Continued from preceding column)

Description of Work	Material Cost	Labor Cost	Total Cost
Cased openings			
Colonnade openings			
Colonnade openings with book cases			
Windows, average size			
Inside base, lineal ft.			
Room cornice, 3 members			
4 members			
Beam ceiling, 5 members			
Picture mold, pine			
Hardwood			
Chair rail			
Plate rail, 3 members			
Wainscoting, cap and floor mold square foot			
Paneling, square foot			
Scraping finish floor, per square foot			
Setting up cases with drawers, each			
Cupboards with doors, each			
Hook strips, per ft.			
Pantry shelves, per lin. ft.			
Closet shelves, per lin. ft.			
Medicine cabinets, each			
Front stairs per step and riser			
Rear stairs per step and riser			
Attic, per step and riser			
Cellar, per step and riser			
Clothes chute, per lin. ft.			
Linen closets, each			
Sideboards, each			
Seats, each			
Mantels, each			

THE contractor who will keep his records of estimates in the above form will find that he soon will have the right dope to enable him to estimate quickly and accurately by the square foot method.

To successfully estimate the labor necessary for the construction of a building, everyone must fix their own rates from actual experience in doing the kind of work which they may be called upon to do.

Tables, prices, and methods, are good in their way, and many times will give valuable aid in estimating, but experience and judgment are far better.

Make a Check List of Material

In estimating materials the most frequent mistake is the omission of some important item. A bill of material for the construction of a building always requires a long list of items, and it frequently happens that some are forgotten and left entirely out of consideration.

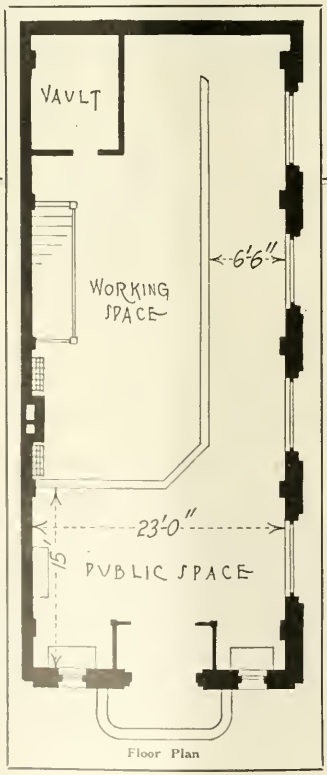
Probably more serious mistakes in estimating material arise from this cause than any other; they certainly are very discouraging to all contractors, especially so to the young man bidding on his first job. The thing he did not count on must nevertheless be bought.

Now, if the contractor had an itemized list of materials entering in the construction there is no doubt that by comparing his bill with the list, many mistakes from omitting items would be avoided.

In a bill there are many items of material that are used for different purposes and different parts of a building, hence to make a list complete in every detail it should mention the part of the building for which each kind of material is to be used.



Brick Bank Design



Floor Plan

Arthur H. Brockie
Architect, Philadelphia

Horace A. Burrell,
Builder, Philadelphia

BUILDERS are often brought in consultation with the bankers who are contemplating the erection of a new home for their bank, and they should be able to suggest many items.

In erecting a bank building careful thought must be given to after requirements as well as present needs. There are many bank buildings today that were built only a few years ago that are modern in design and construction but are entirely too small for present day needs. They were incorrectly laid out and are entirely inadequate to handle the growing business of the institution.

Public space in a bank should not be too limited, there must be plenty of room for the customers, it is here that they congregate to do their business with the bank officials and crammed quarters are uncomfortable to say the least. A bank needs its customers the same as any other mercantile establishment and it is only by making it easy to do business that trade is kept.

The design of the bank shown this month is that of the Logan Office of the Germantown Trust Company of Philadelphia. This building is a dignified looking structure situated on a corner, the size of same being 23x53 feet. One enters the bank through the vestibule and on each side of it is a convenient desk for customers' use, these form little nooks where a certain amount of privacy is obtained.

The architecture of the building is along Colonial lines, a base of limestone extends up to and forms the sill to the four large side windows, above that tapestry brick is used.

The basement contains toilet rooms, lockers and storage space, besides the heating plant and it's necessary coal storage. Ventilation is secured through several windows opening on to areas which are covered with iron gratings at the street level, these are clearly shown.

This design for a bank building has many points of interest and it will serve as a model for other good commercial structures.



PAINTING

Practical Points of Interest to the Builder

Preparing Buildings for the Painter

By A. ASHMUN KELLY

UNFORTUNATELY there is no law or trades rule to oblige the various workmen when constructing a building to have a thought for their comrades of other trades than their own, when at work on the same job. It is every trade for itself.

Where the sub-contractor takes a job at the lowest possible price basis it is manifestly not to his interest to have an eye to the interests of any other contractor on the same job. He must needs push his contract through as quickly as may be consistent with a certain quality of workmanship, this, of course, depending upon the price he is getting.

If, when the house painter takes a job in hand, he could find everything in perfect condition for beginning his work he would be fortunate, but as a matter of fact he never meets this condition excepting on the highest-class construction work, where the price allows for adequate time for attention to the little things which mean so much to the painter, such as smoothed woodwork, care in keeping plaster from it, protection of the floors, care in driving the nails, countersinking of nail heads, and perfect work in plastering, etc.

I believe that it is not common for a painting contractor to make allowance in his estimate for the condition of the job as it leaves the hands of the other workmen. It is true the contract is usually based on certain conditions that in a general way takes this matter in consideration, but it is not usual to find the work in an ideal shape for painting. It is not asking too much of the carpenter, the plasterer, and the others to exercise a little care in their operations, which would not be a matter of any considerable financial concern, and would, I am sure, be worth all its cost in mutual good feeling and a better grade of work.

Be Careful with Plaster

IT is well known that lime, as contained in mortar and plaster, darkens wood, some kinds of woods more than certain others, though any kind will suffer more or less. In fact, lime or other form of caustic is sometimes used to effect this very purpose.

Have the Best Side Out

CERTAINLY much will depend on the workmen, many of whom are careless and not first-class mechanics; it is easy enough to do good, clean work, if one is so minded. I have seen, for instance, a carpenter placing a board with its worst side out, when it could just as well have been placed the other way, and give a better side to the painter if a better was there. I know that some boards have no best side; then I suggest that it be laid aside and be used on a less important part of the job. Take a piece of stuff that has rough places caused by the planer running against a very cross grain—the painter finds a lot of work to do there with putty to make it smooth and level.

The house trim and general run of stuff used in building now is not of the uniform excellence it once was, therefore the carpenter should take a little care in its placing, putting the best of it in the most important places, or where it is to be seen most, and the other in less conspicuous places.

Some trim, for instance, will show stained parts; these are sources of much trouble to the painter, especially where the job is to be done in white or some very light color, for the stain is hard to conceal. Shellac must be used, and this sand papered smooth, and an extra coat or two of paint be given it to bring the part up to the rest of the surface. A little thing, yet of much concern to the painter.

Low Price Means Poor Work

WE can hardly expect a first-class job for the price of a second or third-class job. And nothing is meaner than a poor plastered wall. The painter sometimes paints upon the rough cast, the paperhanger sometimes, and very often, too, papers on such surface. If the job has been well done by the plasterer there will be no difficulty painting or papering such a surface. A poor whitecoat is another that the painter dreads. In fact, it is the worst thing he gets against in the painting business, I believe. There is no end of the trouble it causes him. It is full of lime, burns out the size and diverse problems which only a very expert is capable of handling.

Unfortunately for the painter, perhaps, he has no way open for retaliation, as his work comes last, after the other mechanics, excepting of course the pipe fitters, etc. Else he might give the recalcitrant man of the trowel and hawk some trouble, and likewise the carpenter, etc.

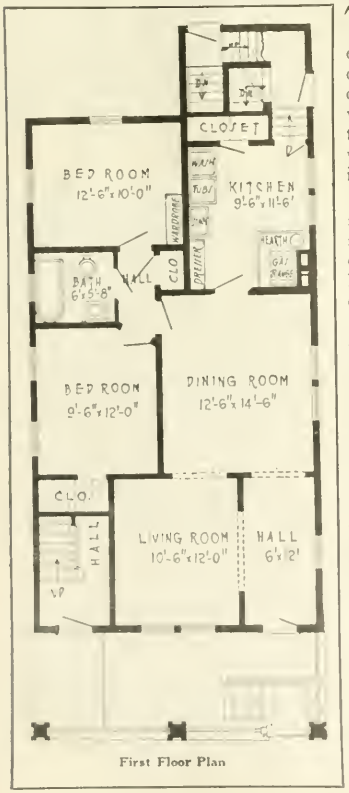
Two Family House

Plans Specially Designed for Readers of Building Age and The Builders' Journal



R. C. HUNTER & BRO.
Architects
New York

Five Conveniently Arranged Rooms



First Floor Plan

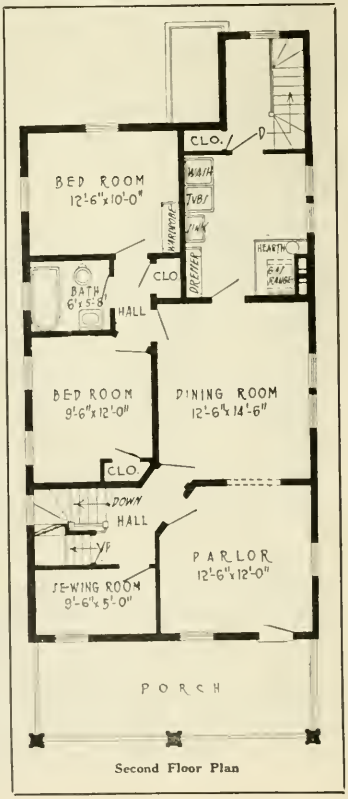
THE two-family house appeals to quite a number of people because it is figured out that the rent of the one apartment will carry the charges on the other. In other words, when the house is paid for the owner can occupy one apartment without expense for repairs, taxes, insurance, etc.

The design presented herewith is so divided that it is actually two separate houses, one family cannot communicate with the other except by way of the outside. The front entrances are separate, there are separate service entrances on the rear and the cellar is divided so that each apartment has its own section reached by an independent stairs.

The rooms are very conveniently arranged. The first floor has a five-room apartment and the same layout appears upstairs with the addition of a small sewing room above the front hallway. Several rooms can be finished off in the attic.

It is interesting to note that this particular house was built at Middletown, N. Y., on a hilly street. This is a problem often met with by builders, and in this case it has been effectively handled.

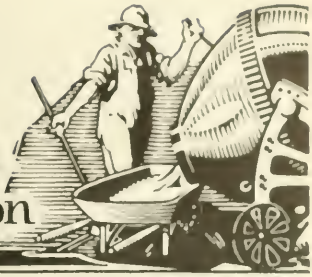
Complete detailed working plans and specificaitons in blueprint form of this two-family Colonial house will be furnished by BUILDING AGE and THE BUILDERS' JOURNAL for a nominal sum

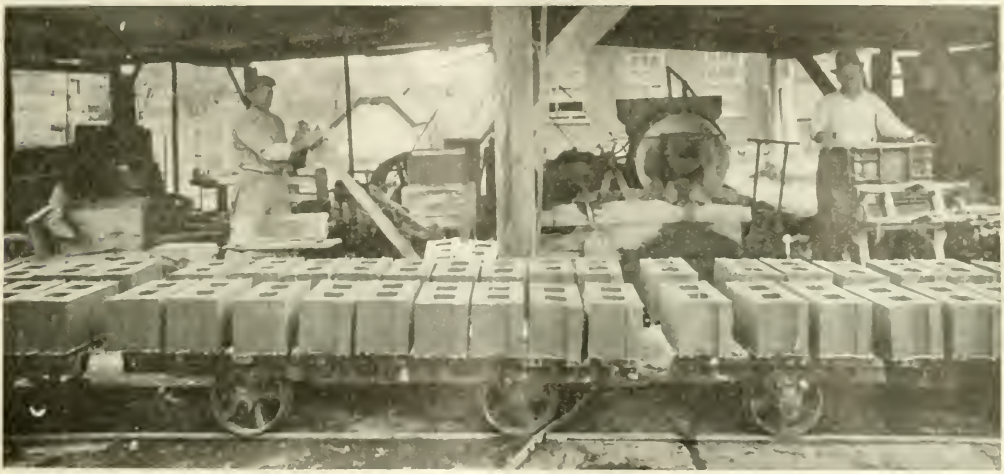


Second Floor Plan

CONCRETE

Form Work-Reinforcing Methods Monolithic and Block Construction





Success in Block Making

A Story of Making the Most of a Building Need

THE use of concrete blocks especially for foundation work, is on the increase. Quite a number of builders are making their own blocks in spare time, but the majority are buying blocks already made from some one who makes a specialty of this business.

Here is a story of how Fred Michelbach, of Bridgeton, N. J., has made a success in supplying local contractors with good blocks. Our picture shows how his plant is arranged, it is practically all out of doors, and operates continually except in cold weather.

Mr. Michelbach was a glass blower, who bought several acres of land some sixteen years ago and then discovered that it contained an excellent grade of sand; seven years ago he started to make blocks and has been at it ever since.

Besides plain blocks, Mr. Michelbach turns out some fancy block with facings of granite, marble, pebble finish, etc., also concrete ornamental columns, urns, flower vases, tomb stones, etc. Mr. Michelbach has two men working for him and they produce 800, 8x8x16 inch blocks in ten hours, they doing their own mixing, etc. His plant consists of two multiplex concrete block machines and a Blystone concrete mixer operated by a six horse power gasoline engine.

The finished blocks are put on flat cars running on a narrow gauge railway and put in a storage and curing shed; in this way the blocks receive the minimum amount of handling until they are fully hardened.

The blocks mostly called for are the smooth face kind which are made in the proportion of three parts sand and one part cement. The blocks are sold locally around Bridgeton, which is a city of about 15,000 population. The demand has been worked up by inserting small advertisements in the local daily paper. The selling price of the blocks is about 50% over the actual cost of manufacture, this price allowing a fair margin of profit besides covering interest on the investment and a certain sum for depreciation of plant, etc.

Of course, it is needless to say that Mr. Michelbach's success in this line is mainly due to the fact that he is turning out good blocks, but he also was a keen enough business man to grasp an opportunity when it came his way, and in this little story of his success many a young man in the building industry will learn the lesson that "Opportunity" is around us in the building line.



Unique Moorish Design for Church

CHURCHES like houses have more or less followed the same exterior design and interior arrangements that are to be found in other churches. We build more or less the way our ancestors did, of course each succeeding generation making a few minor improvements. But we somehow or the other do not break away from the old traditions.

In staid Philadelphia there is a novel design for a church which is rather out of the ordinary and we present a picture and plan of it as being of interest to our readers. One would expect to see a church of this kind in Southern Spain or Morocco, as the architecture is Moorish, and it certainly presents a most unusual appearance, especially amongst the common buildings to be found in our cities. Innovations of this sort are always helpful. They will go down as precedents and will be an incentive for others to strike out for something original.

The church shown here is that of St. Andrew's Methodist Episcopal Church situated at 45th and Walnut Streets, Philadelphia. It was built by Bard P. Evans & Co., Philadelphia, from plans prepared by Mr. C. E. Schermerhorn, 430 Walnut street, Philadelphia. The masonary walls



are covered with white stucco which contrasts with the red tile roof and the timber brackets and rafters. The several hemisphereical domes form distinguishing features. The outside buttresses are covered with tile on the top which adds a little bit of color to the side walls.

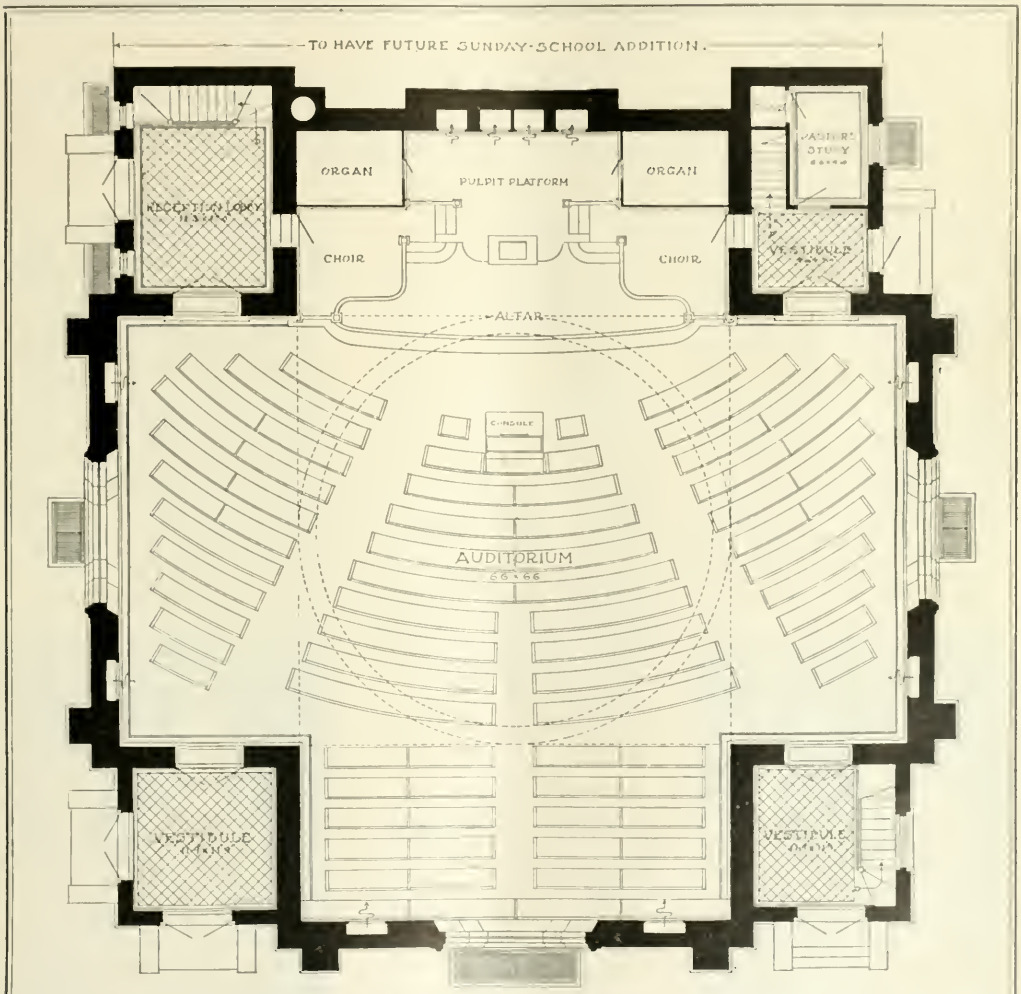
The outstanding feature of these side walls are the large ornamental windows. The central window, that is the one at the front of the church, is of handsome stained glass of which we show an enlarged detail in the lower illustration. The elaborate carving around this window is worthy of special study, it forms a handsome frame for the window. Besides the architecture of the building, the treatment of these windows deserves special comment as being out of the ordinary.

The floor plans given on the opposite page show how the seats are arranged. Particular pains has been taken by the architect so that there is nothing to obstruct the view of the pulpit from any point.

The interior is fitted up in an appropriate manner, particular attention being given to the color of the walls, the furniture and lighting features. These are matters frequently treated as though they were of no consequence and many a good church auditorium has been spoiled in appearance by lack of attention to these details. As the plan shows, a domed ceiling is over the central part of the church and this is a striking feature of the interior.

A future improvement will be the building of a Sunday school room and social hall in the rear of the edifice. Our picture shows the temporary wood Sunday school which is now being used. This will be replaced with the new building, harmonizing in its architecture with that of the church. In some denominations considerable attention is given to activities which are outside of regular church work, but co-related with it. These are the social activities. Some churches in this case being more of a community center than just mere church. In some church buildings, libraries, bowling alleys, different club rooms, gymnasiums and even swimming pools, dispensaries, etc., are included in the church buildings.

Architects of our modern churches try to have the building express a place of worship and select a style of architecture that will carry out this idea.



St. Andrew's Methodist Episcopal Church, Philadelphia
Schermerhorn & Phillips, Architects



CARPENTRY

Good Practice in Frame Construction and Finish

How to Frame a Conic Roof

By RICHARD M. VAN GAASBEEK
School of Science and Technology, Pratt Institute, Brooklyn. N. Y.

A CONIC roof is a roof having a shape like a cone; circular at the base and tapering to a point. It affords a study in laying out and fitting sweeps and methods for developing the exact shape and bevels for the covering boards either vertical or horizontal.

The following description is given of the conic roof problem developed in the Carpenter Shop of Pratt Institute, Brooklyn, N. Y., for the purposes of demonstrating to trade classes the principles involved in framing a cone shaped roof. It affords an opportunity for individual study that would not be possible if full sized timbers were used. In preparing a specification of suitable sizes of stock that were used in framing the problem, the writer urges the reader to lay out and construct the roof, for it is only by actually framing a roof that a clear understanding of the principles involved can be solved and mastered.

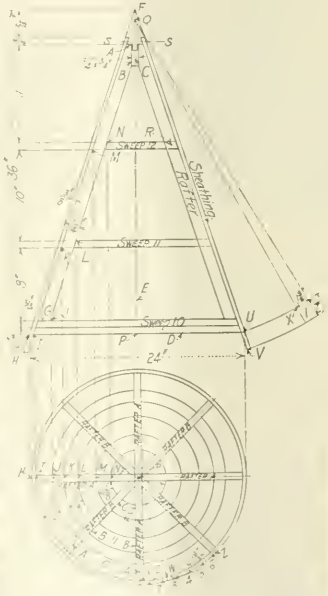


Fig. 1—Plan of Conic Roof, From Which the Working Lay-Out is Made

To make this model have the plate ¾″ x 1¼″ doubled, hip rafters ¾″ x 1¼″, circular ribs ¾″ x 1¼″, sheathing ⅜″, and for dimensions see plan.

Lay-Out

Lay the plan out full size on a sheet of detail paper or a board, Fig. 1. From this lay-out, the exact lengths and bevels for all stock used in framing the roof can be taken.

Lay out the height first and project the various points down to the plan or base of the roof. Produce a base line D and a center line E from which to start the measurements. On the base line lay off 12″ on either side of the center line, the total span to the outside of the sheathing. Lay off on the center line 36″ measuring from the base line as at F. Connect the point F with the points on the base line, giving the desired outer shape of the cone. At right angles to these lines lay off ⅜″, thickness



Fig. 5—Elevation of Conic Roof, Showing Method of Framing

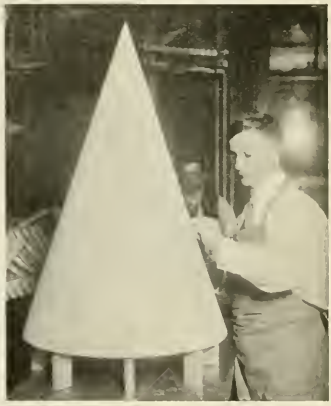


Fig. 6—Elevation of Conic Roof, Showing Method of Sheathing

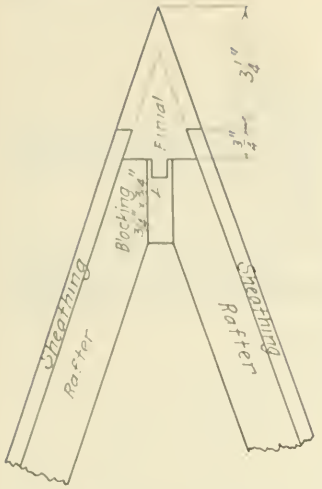


Fig. 2—Details of Finial—Section Through S-S, Figure 1

of sheathing, and 1¼", width of roof rafter, and produce lines parallel to the outside sheathing lines.

Measure up on the center line from the base line twice ¾", the thickness of the plate, doubled, and lay in lines parallel to the base line. Measure up on the center line from the plate level 8", the distance between plate and first rib, ¾", thickness of rib, 10", the distance between first rib and second rib, and ¾", thickness of rib. Through these points lay in lines parallel to the plate.

To eliminate bringing the sheathing boards to a feather edge at the extreme point the rafters are cut off 4" at the top and a finial, turned to continue the lines of the outside of the roof, is fastened in place to give a finish, see Fig. 2. If a ¾" x ¾" blocking is inserted as shown, it will make a strong binder in fastening the various rafters together.

The next step is to lay out the plan. First produce vertical and horizontal center lines and diagonal center lines crossing at an angle of 45 degrees. Project the various distances down from the section of the height to the plan as shown in Fig. 2.

Project the point H on the base line down to the center line on the plan giving to the outside of the sheathing. Project the point I also down to the base line giving the inside sheathing line. Set the trammel points to the radius P-H, which should equal 1' 0", or one-half the span, and with P as a center draw a circle. With P as a center and radius P-I draw another circle, giving the inside and outside lines of the sheathing on the plan. Draw in the full thickness of the rafters ¾", measuring one-half on either side of the center lines.

Project the point J down to the center line on the plan and with P as a center and a radius P-J draw a circle showing the inside plate line. Likewise project the points on the

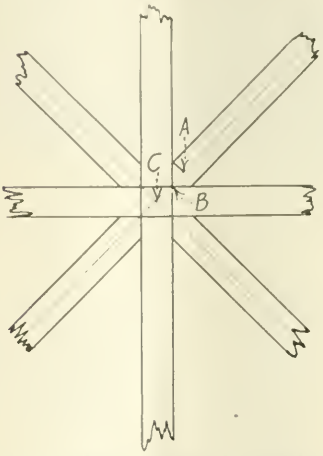


Fig. 3—Enlarged Section Through T-T, Figure 1, Showing Intersection of Rafters

ribs K-L-M and N down to the base line. With P as a center and radius P-K draw a circle, stopping against the side of each rafter. Likewise with P as a center and radius P-L, draw a circle, showing rib 11. With P as a center and radius P-M, draw a circle, with P as a center and radius P-N draw another circle, showing rib 12.

To Lay Out Patterns for Sweeps

It will be necessary to cut out horizontal ribs or sweeps to give nailing for the vertical sheathing boards. One pattern will do for each sweep. Sixteen pieces are required for the plate 10, and 8 for each rib number 11 and 12.

Lay the stock to be used for the pattern on the lay-out and with P as a center and the respective radius used in making the lay-out, mark out the sweeps.

The exact length of plate 10 is on the center line of the rafters, as at A-A. The exact length of sweep 11 is at B-B. The exact length of sweep 12 is at C-C, against the side of the rafters. Cut the patterns to the exact size and bevel for fit against the side of the rafters, but leave the stock to be used for the sweeps at least ⅛" to ¼" longer for fitting. In sawing out the sweeps number 11 and 12, tilt the band saw table to cut to the taper of the roof as at R.

The plate can be laid in position on the lay-out and fitted. In doubling the plate be sure and break the joints well and fasten securely, keeping the nails back from the sawing line. Without removing the plate from the lay-out set the trammels to the desired radius and with P as a center draw the circles, showing the outside and inside lines of the plate.

Remove the plate from the lay-out and cut on the band saw with the table tilted to the angle R. If required the inside of the plate can be cut out on a jig saw, or if care has been taken in framing the plate, the inside can remain square.

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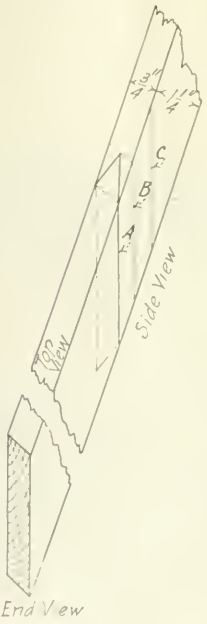


Fig. 4—Development of Upper End of Rafters B, Showing the Method of Fitting Against Rafters A



CONTRACTING EQUIPMENT

Reliable Information on Time and Labor Saving Devices

Removable Steel Forms

Concrete Beam and Floor Construction Simplified

By N. F. AMBRUSEN, C. E.

HERETOFORE wooden forms have been used almost entirely in the construction of concrete structures with an enormous waste of lumber and labor, which is well known by all interested in this class of work.

Our country's resources of lumber are rapidly diminishing, and the increasing difficulty of getting the lumber out of the forests increases the cost to such an extent that it will not be many years before it will be prohibitive for use in concrete work. Therefore, we must turn to other materials that will take its place so as to conserve our forests and use the lumber for purposes for which it was intended, such as houses, and the cheaper class of other buildings.

Steel forms have been used to a certain extent in building construction with a view of saving materials and labor, but so far it can only be considered as a substitution of materials. For a good many years the forming of the arches or slabs between steel joists has been done with permanent steel pans, which are left in place and become a part of the structure. This is a waste of steel as it performs no function as to the strength of the structure. It is merely a substitution of materials.

Removable steel forms have also been used, but with little or no saving in labor and materials as the lumber required for supporting these steel forms has not changed since the very beginning of the adoption of this particular type of floor construction. There are steel forms on the market today for other purposes, such as column moulds, which have been made standard and so considered by the designing engineers, with the result that in using these forms the cost of erection is much less than in using wooden forms. They can be used over and over, not only on one job, but on several.

There is no reason why this cannot be applied to the Beam and Floor Construction, and we believe the system of forms and shoring described in this article has accomplished this and proven it by a good many jobs already completed.

These forms are made in standard sizes and standard lengths, and supported by a standard made up shoring, and erected by a standard crew —and this standardization means *economy* and *low costs* in the *final results*. The most costly part of reinforced concrete construction is the form work and the primary object of this system is to make the forms into plant instead of the old lumber pile which goes to waste. Not only the steel forms, but the supporting wooden shoring, becomes part of the



The Supporting Timbers for the Channels and Pans—Note the Clamps That Hold the Removable, Upright Supports

contractors' equipment fully as much as the concrete mixers, hoists, etc. These steel forms can be rented.

This cuts down the labor account and speeds up the work as the system only requires less than half the amount of materials; as it eliminates all reshoring, and 90% of the field fitting. As the system is standardized, it naturally follows that the costs become uniform, and therefore the only fluctuation, if any, is in the variation in the cost of labor in the field.

These forms consists of standard steel channels of certain lengths to be used for the soffits with an equal amount of steel pans with detachable headers and a corresponding amount of stretchers and cover plates. The channels are standard 6-in. channels, made in standard lengths of 6 and 8 feet, and these lengths combined with the stretchers would cover any fractional variation of spans. Holes for wires or bolts for hanging the ceiling are punched on the center line 12 in. apart.

The pans are die pressed from No. 14 gauge steel, 6, 8, 10 and 12 in. deep, and in standard lengths of 6 and 8 ft. to match the channels. These pans, in connection with covers, will meet any variation of spans. The headers are essentially a part of the pans and practically the same number is required.

The cover plates are also die pressed from No. 14 gauge and large enough to fit tight enough over the outside of the pans. The length is 30 in. and with a depth matching the pans.

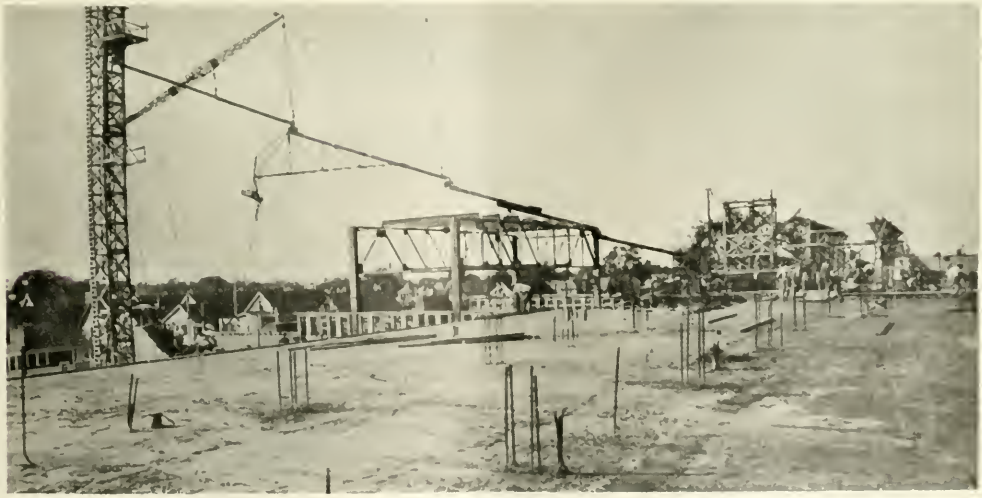
The stretchers are die pressed from No. 14 gauge and the same length as the covers, and the two working together, form the sliding members which adapt the system to any variation of spans.

As you will note, the above material is made heavy enough to withstand the ordinary rough handling in the field, and, naturally, will last indefinitely. In connection with these forms, a spreader is used in locking the forms together and, at the same time spacing the reinforcing bars in the proper position, and this spreader also acts as a chair for the bars. These spreaders are applied and are buried in the concrete when poured; they are really the key and are made of one piece and placed in the forms

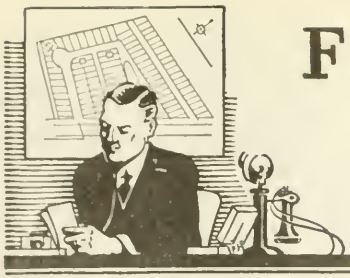
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The Steel Pan Forms Placed in Position on the Channels, When All Are Set the Job Is Ready for the Pouring of the Concrete



Chuting the Concrete For the Beams and Floor—Notice the Elevator Tower With a Substantial Ladder On Its Side—Safety First Has Been Rigorously Observed On the Job For the Patrick Henry School, Cleveland, Ohio



FINANCE and REAL ESTATE

Helpful Data for the Builder Who Builds to Sell

Single House or Co-operative Apartment?

Interesting Deductions of a Prospective Home Builder on the Kind of a Home He Can Afford to Own

By JAMES T. BEARD, JR.

CHANCING to read an advertisement in a recent New York Sunday newspaper, its heading, "Eliminate the Landlord's Profit," appealed to me. The ad sung the praises of a large co-operative apartment development in the vicinity of Manhattan, just twenty-two minutes from Forty-second Street. It sounded well to me then, but I have learned a lot of interesting things since. I guess one always learns some new things in a process so intricate as house-hunting.

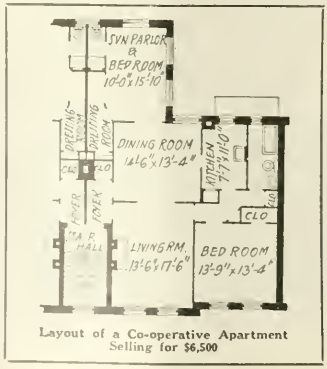
Today the words of that ad recall to my mind a little personal incident that happened when I was a traveling machinery erector. In the performance of my duty I ruined a new shirt, so I charged it on my expense account, but payment was refused, so I quietly "padded" my next expense account to cover the item.

And so with the landlord's profit. The greedy, gouging landlord. "Eliminate the landlord," said the ad, "by buying one of our beautiful apartments on the co-operative plan. Become a Tenant-Owner."

So I went around to see these apartments. I timed myself on the subway and they were just twenty-two minutes from Forty-second Street. I saw the rooms with the light and air streaming in every window, the playgrounds for the kiddies, the tennis courts, etc. I was pleased and inquired about prices, payments and other details.

Here is what I found. The rent-raising, profit-making landlord was very much like my shirt. You couldn't see him, but he sure was there. He was disguised in many forms, such as charges for coal, water, janitor service, taxes, interest, repairs, amortization, management and fixed charges. Management and fixed charges are very broad terms and cover a lot of ground. At any rate, the elusive profit of my old friend, the terrible landlord, was successfully disguised as one thing and another. I couldn't put my finger on it, but I could feel it.

I wanted a five-room apartment. For this I was to subscribe for $6,500 worth of stock in the Co-operative Association. I must pay $2,000 down on my share in this equity, leaving an unpaid balance of $4,500. I would then be entitled to a lease on this five-room apartment, provided my name sounded good to the members of the Association and they were assured that I was not a disreputable and undesirable character!



Layout of a Co-operative Apartment Selling for $6,500

My contract required a monthly payment of $134. Of this amount $61 a month would go for my share of the operating expenses of the apartment house and the rest ($73 a month) would pay off my indebtedness and interest in six years and four months.

Certainly no one should object to paying $134 a month for five rooms. Five similar rooms rented for $50 a month in 1910 with a month's rent free. Surely they should be worth at least $134 today!

But this particular unit of the big house-hunting public didn't want to pay $27 per room until he saw what he was getting. I asked some more questions. In six years and four months my stock would be paid for. Then I would own my apartment; the five rooms would be mine. Would there be any other payments, I asked? Oh, yes, a small item of $61 a month would still be charged to cover the management and operation of the building. As a matter of fact, after my stock had been paid for I would have to make monthly payments of $99 for the rooms, but I would receive a dividend every six months equivalent to $38 a month. This would make the actual cost only $61 a month.

I found out another interesting thing. After I had paid for my stock I did not own my apartment. My five rooms were not mine. Although I had paid $2,000 down and $134 a

month for 6 1/3 years ($12,-184 in all) for a $6,500 apartment, that apartment was not mine. There was a string tied to it. If I wanted to sell they would let me sell my stock, but the purchaser could not live in the apartment without the approval of and lease from the Co-operative Association. If I wanted to remodel my apartment I had to get consent.

Five rooms, unfurnished for $61 a month. Sounds like an old-time To-Let ad, doesn't it? Those were the good old days. At that, it was a pretty gouging, greedy landlord that charged $61 a month for five rooms in those days. It was more like $50 a month, with the proverbial month's rent free.

Who knows but in ten years, after I would have become a full-fledged Tenant-Owner of my Landlordless Apartment, some of the old-time landlords would again be charging $50 a month, while I would still be chucking in my little sixty-one dollar ante every month. I am merely speculating. I say, "Who knows?"

But what bothers me is why does a man who has paid over twelve thousand dollars for a sixty-five hundred dollar apartment have to pay more rent for the apartment that he owns than the poor sucker will pay six years from now to some profit-grasping landlord for the apartment that he doesn't own. And what difference does it make if I give $5,500 profit to said gain-greedy landlord, or donate it to a Co-operative Association. A rose by another name smells just as sweet.

I admit, I am a trifle dull. I cannot always fathom the depths of this real estate finance. But, today, I am paying only $55 a month for five rooms, with alcove, attic and basement to boot. Of course, I am only a Tenant—not a Tenant-Owner.

But, being a simple minded and rather obstinate individual I still wanted a house and I still had a hunch that a house could be had on terms that an average man could pay. I had an architect prepare a plan for a seven room house and submitted it to a builder for an estimate. He said he would build it for $6,500, which was just what my stock in the five-room apartment would have cost. I could pay $2,000 down and arrange with a Building and Loan Association for the balance. The building loan people looked over my plans and would give me $4,-500. My payments would be $45 a month for a period of 11 years. The operating cost of my house (taxes, insurance, coal, etc.) would be $42.50 a month.



Type of Separate House That Can Be Built for $6,500

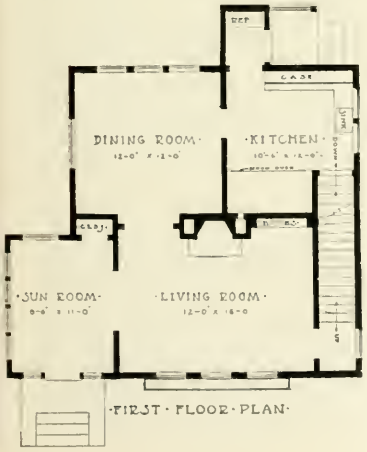
In other words, I could live in a brand new seven-room stucco home, with my own yard, my own cellar—my own house, to do with as I liked—for $87.50 a month for the first eleven years. After that it would cost me only $42.50 a month to run it. Now, I can afford $87.50 a month, but I can't afford $134 a month. Even if I could afford it, I would be seven kinds of a boob to pay $134 for five rooms, when I can get seven rooms for $87.50.

But the real milk in the cocoanut (or, shall I say, the big fly in the ointment) comes after the final payment has been made. For, it would cost me $61 a month to run the five-room apartment, while I could run the seven-room house for $42.50. And, best of all, I would be a full-fledged, honest-to-gosh Owner.

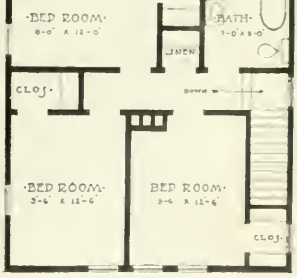
COMPARATIVE FIGURES

	Co-operative Apartment	Separate House
Value	$6,500.00	$6,500.00
Cubic feet living space	11,232 cu.ft.	12,690 cu.ft.*
Terms:		
Cash down	$2,000.00	$2,000.00
Monthly payment on indebtedness	73.00 (for 6⅓ yrs.)	45.00 (for 11 yrs.)
Monthly operating cost:		
Taxes	None	$11.67
Insurance	None	1.67
Coal	None	12.50
Repairs, etc.	None	16.67
Total	$61.00	$42.50
Total monthly payments	$134.00	$87.50
Monthly cost after paid for	$99.00	$42.50
Dividend	$38.00	None
Net monthly cost after paid for	$61.00	$42.50
Total cost for 11 yrs.	$15,000.00	$13,550.00

* For the 7-room house there is attic and basement in addition to this figure.



FIRST FLOOR PLAN



SECOND FLOOR PLAN

WHAT'S NEW



New Materials and Equipment that Keep Your Work Up to Date

Sash Balance Improvement

SPRING sash balances have gained favor every year. Each detail of their construction has been perfected, and today many users find them the most acceptable method of window balancing.

A new invention just developed by the Pullman Mfg. Co., Rochester, N. Y., is their patent tape hook device, which enables the balance to be installed or removed without removing the sash from the frame. In new work you may fit and fasten the sash into frame, put the stops all in place and leave the installation of the balance until the last, if so desired. Likewise to remove the balances is an easy matter and is done without disfiguring or marring the woodwork. There is quite a difference between this method and the old weight and cord where if a cord should break the average home owner had to call in an expert carpenter to handle the situation.

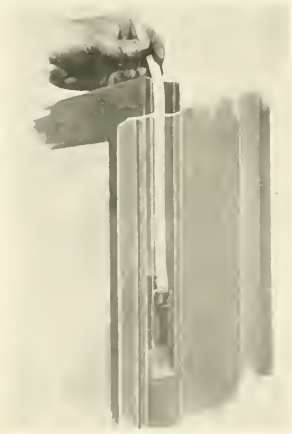


Fig 3—Inserting

The importance and possibilities of this new Pullman Sash Balance invention cannot be overestimated when you take into account the labor involved for the removal and replacement, also the refinishing of the sash and frame. In installing the sash balance the tension must be taken off the spring while attaching the tape to the sash. The well known method is to pull tape out as far as possible and insert an ordinary wire nail into the slot in the drum, as shown in Fig. 1. A special wedge is now made to take the place of the nail. To release the nail or wedge just pull the tape a trifle, when the nail or wedge will drop out of the slot.

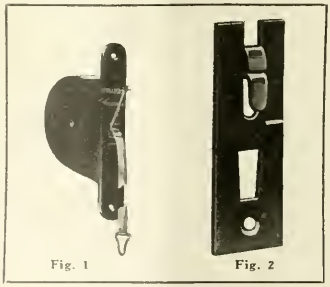


Fig. 1 Fig. 2

Of course, one must select the right balance for the weight of the sash. Another point to look out for is to keep the tape absolutely free from paint, otherwise it will gum up the drum and seriously interfere with the action. One could hardly expect the balance to do proper work unless this precaution is taken.

The new device consists of the special type loop which is shown in Fig. 2. This is to be fastened to the sash in a special short groove as shown in Fig. 4. This groove is made by means of a 3½ inch cutter in less time then one can make the groove for cords

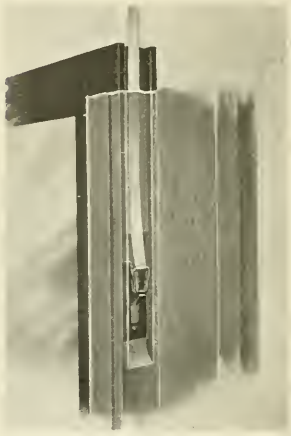
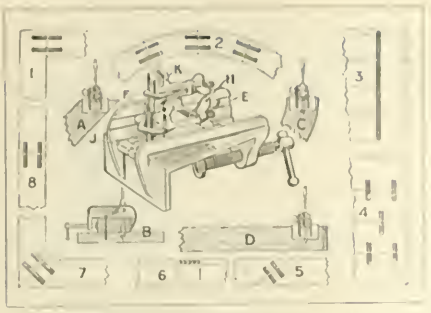


Fig. 4—Removing

To install withdraw sufficient length of the tape from the balance and insert wedge or nail so as to hold it securely. Now insert tape with the loop on the end into the groove in edge of sash, and when it strikes the angle piece push lightly so that small end of loop will be depressed and larger end raised, then slightly pull the tape very tight, holding loop in place while the wedge is removed and the tension will then hold the hook in place.

To remove the tape pull it out and wedge it the same as for installing. Then pull tape upward firmly against the hook so as to take up the slack and push it downward a little until the end of the loop is clear of the hook, when it will spring away from the hook, enabling the tape to be withdrawn. The size of the hook plate is ¾ inches wide and 2⅞ inches long, and it should be set in the groove so as to be about 10 inches from the top of the sash.



Doweling Jig

THE tool shown herewith enables the user to bore dowel holes in the edge, end or surface of work with ease and accuracy. It is made by the Stanley Rule & Level Plant, New Britain, Conn. It can be used on material up to three inches. It also forms an excellent bit guide for mortising.

When making dowel holes with only a brace and bit it is also necessary to use a square to insure the hole being bored perpendicular to the edge of the stock, and even then more than ordinary skill is required to produce perfect work.

With the Doweling Jig the steel guide is automatically set to guide the bit properly when the Jig is clamped to the work.

If drill bits are used there will be no danger of boring out of line, even in cross-grain wood or through knots, and the use of drill bits is recommended for quick and accurate work. However, excellent work can be done with the ordinary worm bits if care is taken to see that they fit closely in the guides. To allow for variations in size of bits the guides are made 1/100 inch larger than the sizes given.

In the illustration, which shows the tool complete, "E" is the slide carrying the steel guide "F," by means of which the bit can be brought to the required distance from the edge of the work.

The guide "F" is held in slide "E" by the screw clamp and thumb nut "H."

Having decided upon the distance the dowel hole is to be from the surface of the work, place the bit guide in the slide, bringing the two marks on lower edge of guide the same distance from the end of the Jig as the center of the dowel hole is to be from the surface of the work. The under side of the Jig is graduated for this.

Then place the Jig on the work, bringing the mark "J," on the front of the tool, so that it is in line with the mark on the edge of the stock.

A depth gauge "K" is also furnished which can be used with or without the Jig. Where used without the Jig, the gauge should be set with the gauge end towards the point of the bit, but in using the same with the Jig it should be set with the small end down, as shown.

Figs. 1 to 7 show various forms of work where the Jig can be used to good advantage; thus 1 shows a butted corner; 2 shows circular segments; 3 single matching; 4 staggered matching; 5 spliced joint; 6 mortising; 7 mitred corner; 8 butt joint.



Steel Cellar Windows

CONTRACTORS and builders in general will be interested in a new basement window in steel now being marketed for use in residences, stores and apartments by the Detroit Steel Products Co. of Detroit, Mich.

A number of advantages are claimed for the new window, which is designed to take the place of wood windows, and which is being sold through dealers at prices which bring the cost to the building owner as low or lower than wood.

The chief argument advanced in favor of the steel window is that it admits 40 per cent. to 50 per cent. more light for the same sized masonry opening. This extra illumination is secured through the use of narrow solid rolled steel bars in both frame and sash, thus eliminating the wide wooden members and permitting the use of large glass lights.

Another advantage which will be appreciated, is the fact that the steel window cannot warp nor stick. The difficulty experienced by the average home owner in trying to open and close his wood windows, when the sash have swollen and warped, is entirely eliminated as the steel members are unaffected by moisture.

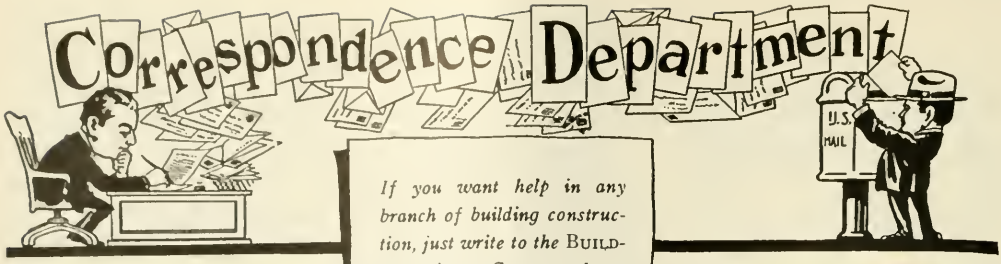
The outside bars of the window are not intended to imbed in the building construction in the way usually employed where steel sash is used. The building construction is intended to come up flush and tight against the window on both sides, and at top and bottom, anchorage being secured by means of four straight, flat pieces of steel about 1" wide to 4" long. These are laid in the mortar joints in such a way that the ends extend about ½" into the channel frames at the jambs of the window. Two clips are used on each side, and these are sufficient to anchor the window solidly.

Portable Hoist

THE raising of construction material on the site can be more economically done even on a small job by using a small, easily moved gasoline driven hoist. The picture below shows such a hoist and it will give a good idea of its size. It shows the No. 7 reversible hoist made by the C. H. & E. Mfg. Co. of Milwaukee, Wis.

The advantages of such a hoist will be obvious to every contractor. The expense of moving a heavy boiler and steam engine hoist has prevented their use on many smaller jobs, but this type of a little gasoline engine driven hoist solves some of the problems. It does not need a licensed engineer.





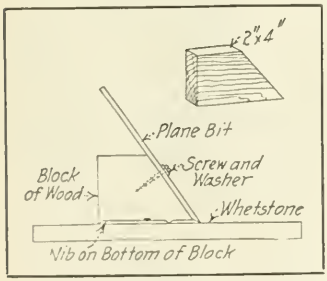
If you want help in any branch of building construction, just write to the BUILDING AGE *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Sharpening Plane Bits Accurately

IT takes an experienced hand to correctly sharpen a plane bit. The average bit, when touched up on the stone is more or less convex on the bevel, and the work which results is not as accurate nor clean as when this bevel is exactly straight.

After ascertaining the correct angle which the edge of the bit makes with the straight stock, cut a block of wood from a piece of two by four inch material about four inches long on the base. Drill a small hole into the beveled side of this about half way from each side and vertical with this surface and procure a two inch screw with a washer just small enough to slip through the large end of the slot in the bit.



The base of the block is gouged out with a wood chisel leaving a slight elevation at each end which rest upon the surface of the whetstone when in use. The bit is slipped into place, and the screw tightened to hold the bit firmly and the edge brought to the proper shape by light, circular motions.

I have found that this stunt was well worth while for the occasional user of planes, since a keen cutting edge can be put on the bit in short order.—**Dale Van Horn.**

Short Cuts in Putting on Trim

I HAVE a little kink for putting on casing that I use on all work possible and no doubt many carpenters may also use it, but the large majority I come in contact with do not.

I use a crotched gage cut out about ⅞ and about 8 inches deep which I carry with my kit in putting on casing with my cap finish. I nail on the head casing first, then fit the side casing to the floor. Slip this gage over the side casing under head and mark on face above gage which gives the perfect fit, and saves fitting head to casing. This is especially valuable where material has been filled or stained. Now in putting down base I use another short kink with this gage and pencil dividers where base runs from corner to door casing. First lay base down in place, then set dividers to required width and scribe corner, next move over to door casing, and slip on gage against casing and scribe the same amount alongside gage. Use a good, hard pencil, quite sharp. A 5 or 6 H is best. I use this always with perfect fits, as it makes a clear, sharp line.

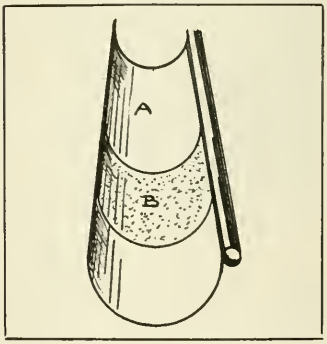
Previous to using this method, I, as every other carpenter I have ever seen, would fit the corner, then put down again to mark for casing end.

I also might offer another kink on trimming which I consider a great time saver. I start at a convenient place and number, on the wall or grounds, the base spaces from 1 up. After numbering all I go around with a board and mark down the measurements of each space and place opposite to each corresponding number, allowing one or two inches over for fitting.

After taking a record of all the lengths I take my saw and cut up the base material into lengths best suited to the material on hand, and mark out each length to be cut and place the corresponding number on back of base, which can then be taken to the work bench for cleaning or dressing if required. I find this much better than letting carpenters take long lengths to rooms to be cut, as it saves the waste of having short pieces left over.—**Andrew E. Smith.**

Repairing Damaged Eave Troughs

I AM certain this sketch is worth publishing in your very practical magazine, as it will be of much interest to many of your readers. It is the method I used to mend eave troughs that are not too badly rusted to be beyond repair. I first clean the old trough thoroughly and then apply a thick coat of mastic roof paint (or asphalt paint as it is called), to the entire interior of the trough and on this paint I lay a good quality of prepared roofing or canvas and then thoroughly paint same, includ-



ing the edges of the lining to prevent the wind from getting between the lining and the metal eave trough. I repaired several troughs in this manner two years ago and they are in good condition at the present time. In the sketch A is the lining of roofing or canvas, B the mastic paint and C the eave trough to be repaired.—**D. W. Daly.**

A Sleeping-Porch for Every Bedroom

TO include a sleeping-porch for every bedroom should be one of the most important features of home planning. Considering the hygienic necessity of sleeping with the windows open and then realizing that the single bedroom has not been improved upon since man slept in a cave, as far as dressing in warmth is concerned, is it not natural to reason that

bedrooms should be planned with a little more commonsense, and foresight for comforts that could easily be enjoyed?

In place of the usual single room there should be two rooms—one just large enough for the bed, with sufficient space to get around it, and the other of a size meeting needs for a dressing room. Bedrooms can be arranged in this manner if the house is planned with this end in view, judicious planning though being essential to get a harmonious arrangement; such details as placing the sleeping rooms to avoid one adjoining the other, insuring access of sunlight, and placing rooms to utilize space to the best advantage, must all be considered.

A style of window hardware is available that permits of the real thing in a window opening for a sleeping-porch room; it is for casement style sash, being so hinged and operating on a track set in the sill and by rollers and a groove in the top jamb, as to permit of folding the windows to each side, thus procuring the large, airy opening which offers that intimate touch with the outdoors that a sleeping-porch should convey. In inclement weather these windows may be closed to any degree desired.

A glass door should be hung between the two rooms. This provides more light for the dressing room—may perhaps supply the only ingress of sunshine—and conveys a sense of coziness at the same time that it serves a purpose; it also links up the two rooms quite intimately.

The outstanding feature of this arrangement is that one may sleep in a room to which plenty of fresh air is accessible and also enjoy the comfort of dressing in a room that has not been exposed to the outdoors temperature all night long; during the day the glass door may be kept open and the sleeping room windows closed, thus permitting the sleeping room to be thoroughly warmed and comfortable at the hour of retiring.—**Hans K. Hoerlin.**

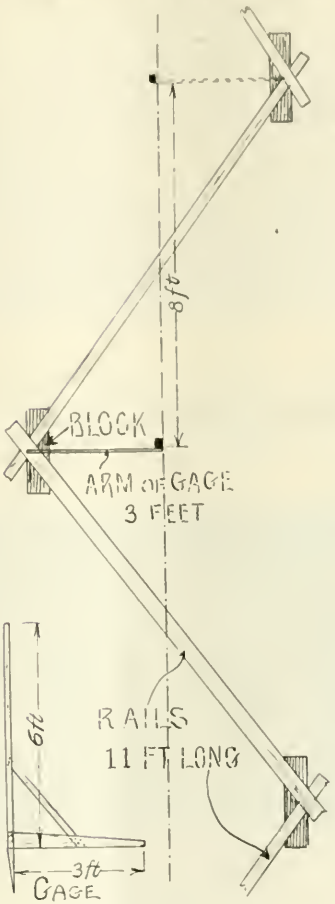
Building a Worm Fence

I SEE by the December issue of BUILDING AGE a subscriber asks for a sketch of a "worm fence" or rail fence as it is usually called here. I hope this will solve his problem.

I have helped my father build them when a boy and will try to give directions and a sketch of same.

First cut rails 11 feet long and if timber is over 6 inches diameter split in halves, quarters or more, according to size of timber, so that the rails will be as near one size as possible. Also cut blocks 2 feet long and about double the size of rails to place under corners, these are required every 8 feet of actual length of fence.

Set stakes about 5 or 6 feet high down the center of proposed fence line about every 15 or 20 rods. Make a gage as follows, take a stake about 6 feet long, sharpen one end so it can be set in the ground easily. From a board cut a cross arm 3 feet long 3 inches wide at one end and 1 inch at other. Nail this to stake about 16 inches from bottom at wide end, also a small brace. Set this gage at starting point directly in line of stakes in fence row, turn cross arm at right angles to fence, place on block under the end of arm, set gage ahead 8 feet and turn arm in opposite direction and place block and so on down the line. Start rails first one on two blocks diagonal of fence line and second one ending on top of first rail and other on block and so on; then second layer in the same manner until desired height is reached. Sometimes stakes are driven on either side at cross section and wired at top to prevent winds blowing over or stock pushing down.—**Andrew E. Smith.**



HAVE you ever used any machinery or device which has saved you time and money? Have you ever invented any way of doing a piece of work quicker?

If you have BUILDING AGE wants your experience, and will pay regular space rate for it.

Your description should tell just how you saved time and money, either by a special way of using machinery or by short cuts in construction. Point out what methods you were using before adopting your "Time Saver" and show how your new method turns the trick. You can submit as many articles as you want.

Address The Editor, BUILDING AGE, 920 Broadway, New York City.

Staining Shingles

THERE is economy in staining roof shingles. This is a fact that is not to be doubted, though the practice has still to find wide favor. Wood shingles offer one of the best and most attractive roofing materials known. But with the many manufactured preparations now on the market one is often induced to select something else in place of wood shingles for the ultimate saving alone. Wood shingles are not permanent. But when properly treated with stains or paint, they become much more so than when left in their natural state, and besides that the appearance is considerably enhanced.

It is the general rule to use but one color with wood shingles. For the roof of the house a dark stain such as green or red is quite appropriate. Shingles in green, white, gray and red may be obtained, but the staining can be done equally as well on the job just before they are applied. It is a mistake to stain shingles after they have been laid.

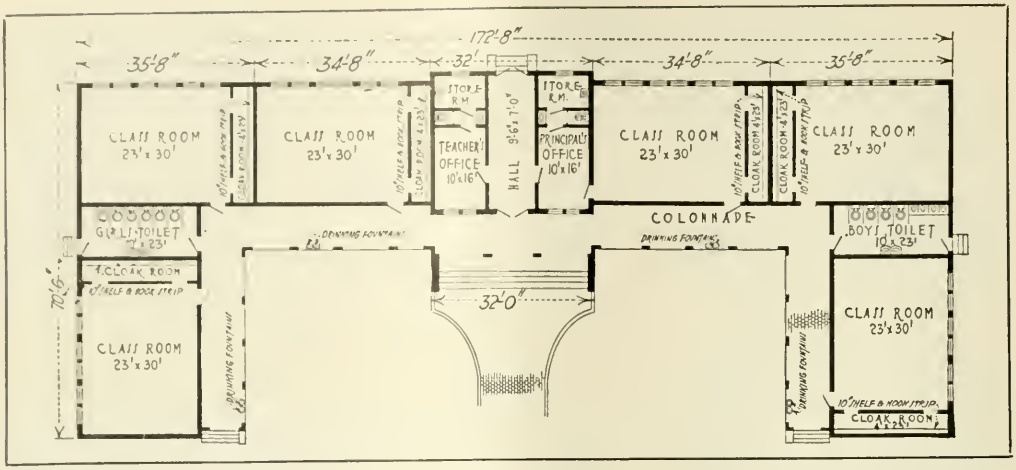
When the stain is applied on the roof, the wood under the row next above is not impregnated with the water proof material, and it is just this portion of the shingle which needs it the most.—**Old Timer.**

Saw Filing Kink

HERE is a saw filing kink that I think is original with me. Take a smooth board 6 inches wide by 30 inches long and on one end draw lines at right angles and ⅜ inch apart as a guide for rip saws, on the other end at whatever angle you want the bevel on tooth (like cut).



To use place board behind saw vise almost level with the same and parallel with saw. Make all file strokes parallel with the guide lines. With this I can make a needle run full length on most any old saw and that is some test for good filing.—**George E. Cole.**



Southern School of Hollow Tile

THE design shown on this page is an interesting example of a modern southern school. The arrangement of the different class rooms is shown in the plan above. This school has just been completed at Arco, a suburb of Brunswick, Ga. The contractor and builder on the job was Mr. E. Merritt, of Brunswick, Ga., and Greenville, Ala., who also prepared the plans and specifications.

The architecture of the building follows Spanish lines. The walls are built of 8 inch hollow tile covered with stucco, the finish coat composed of white Atlas cement and white sand. The roof is covered with imperial red Spanish tile.

The large circular space over the main entrance is to have a clock which was not installed at the time these two pictures were taken for us.



Provision has been made in the design so that additional class rooms can be annexed. The new class rooms would be built in front of each wing, the colonnade being extended in the same style as shown.

The floors throughout are of cinder concrete, laid directly on the ground, there being no cellar. In the class rooms yellow pine floors have been laid on sleepers imbedded in the concrete. The corridor, colonnade and walks are paved with 6 inch square terra cotta tile laid over the concrete. The steps are all built of brick. As can be imagined but little heat is required and this is supplied by two No. 5 Arcola Hot Water Systems.

All class rooms are of the same size and are so arranged that the pupils will have the light from the left. Blackboards of slate are provided in each room, also large wardrobes. There is no interior hall, access from one room to the other being through the colonnade.



Modern Private Garages

Two Designs with Pergola Porch Fronts



PRIVATE garages are necessary adjuncts to the modern suburban residence. The design should conform in external appearance with that of the house so that it will form a pleasing part of the backyard vista.

Garages are common enough, but the two designs we show on this page differ in having a front porch as it were, both of pergola type. These designs will look very picturesque when vines are grown across the pergola tops.

The garage shown above is of comparatively cheap construction, the exterior walls being of drop siding with corner boards and the roof of asphalt shingles. This is a single car garage, size being 16x20 feet outside dimensions.

The garage shown below is an artistic example of brick work suitable for two cars. It was built for Mrs. Jules Wellens, at Germantown, Pa., after plans prepared by Heacock and Hokanson, architects of Philadelphia.

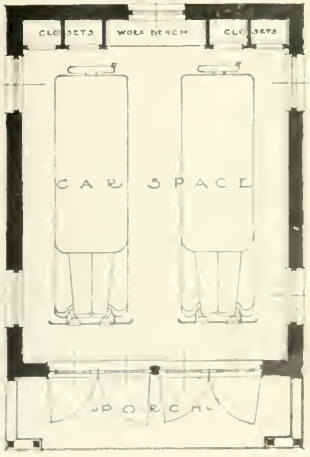
It is interesting to note that part of this garage is underground, as it is set in the slope of a hill, it is an artistic and practical design exceptionally well carried out.

It is a curious fact that the great majority of people want a cheap garage, and this is the reason why there are so many of the portable tin cans ornamenting backyards. It costs but a little more to have a good-looking design that will be in harmony with the house, and builders should try to impress upon their customers the desirability of having something good to look at rather than an eye sore. What could be more interesting to look at than one of these flower covered garages that help make the back yard picturesque.

Years ago when the surbanite had a $50 cow he would not object to paying a few thousand dollars for a barn to house the said cow, but nowadays the same party or his descendants do not hesitate to spend a few thousand dollars for a car and then want to keep it in a $100 shed. Times have changed.

Of course, it means a little more profit for the builder to erect a desirable garage, but good looking structures will add to the value of the owner's property as well as to the whole community.





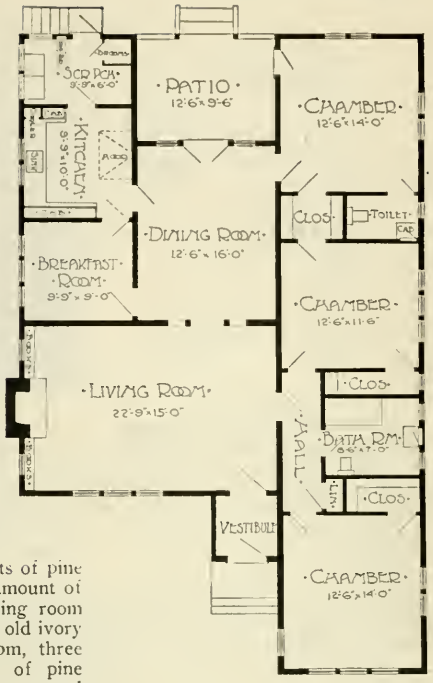
Well Planned Bungalow With Rear Patio

Designed By WALTER S. DAVIS

ILLUSTRATED herewith is an especially well-planned and attractive new-style California bungalow designed with a delightful little rear *patio*. This *patio*, enclosed on three sides by the house walls and open to the back garden, is directly accessible from the dining room, through French doors, and from the rear bed room. The front entrance is by way of a small vestibule, with an outer door of glass set in an arched doorway, which opens into the large living room, and window boxes beneath the two groups of front windows constitute enhancing details.

The outside walls of the house are of coffee-brown cement-stucco over frame construction, and the roof is of wood shingles painted black. The trimming consists of light brown for the window frames, the front door and the flower boxes and white for the window sash. The entrance steps and stoop are of brick, and brick is also used for the construction of the outside chimney.

An open doorway, colonnaded and buttressed, connects the living room and dining room, and a short hall, accessible from the former, brings the two front bed rooms into communication with the bath room, while a pass-closet intervenes between the middle and rear bed rooms. The back sleeping room, incidentally, is provided with an individual toilet, and each of the bed rooms possesses a good wardrobe closet. The built-in features include, as reference to the accompanying floor plan discloses, book-cases at each side of the livingroom fireplace, a linen closet in the hall, a drawer cabinet in the toilet of the back bed room, a medicine case in the bath room, a draught cooler-closet and a great deal of cupboard room, besides the other usual conveniences, in the kitchen, and a disappearing or cabinet ironing-board and a closet for brooms on the rear porch.



The interior finish consists of pine in old ivory, with a small amount of mahogany trim, in the living room and dining room, of pine in old ivory alone in the breakfast room, three bed rooms and hall, and of pine enameled white in the bath room and kitchen. The walls in the breakfast room are finished with a paneled wainscot and plate rail, with the space above papered, and paper is also used for covering the walls of the living room, dining room and bed rooms, while in the bath room and kitchen they are finished to a height of four feet six inches with a smooth, hard plaster coat which is enameled like the woodwork. Oak floors prevail throughout, except in the bath room, kitchen and rear porch, the bath having tile flooring and the kitchen and porch pine. The fireplace in the living room has a wood mantel, interestingly designed, and a tile hearth.



The unusual features of this house design are the two triple windows; one in the living room and the other in the front chamber. These two windows extend to the ceiling in both rooms and above the double hung sash are transoms. This arrangement of these two feature windows presents the opportunity for some very artistic decorative treatment on the interior; the large glass area gives the feeling of being a part of the great outdoors.

The bungalow has neither a finished basement nor cellar, but the slope to the ground naturally leaves a roomy storage space under the rear which at any time can be easily converted into a basement, with outside entry. The equipment includes built-in gas radiators and all other modern conveniences. The house is located in Los Angeles, California, and was designed by Walter S. Davis, of that city.

How to Frame a Conic Roof

(Continued from page 47)

Place the stock to be used for the rafters on the lay-out and transfer the lines. The bottom is a plain bevel cut against the plate as at G. The top is cut at A against the final and at B against the blocking. Cut four rafters A to this size and fasten in position with blocking for a binder. The blocking gives better nailing and facilitates handling and holding the rafters in position when assembling. Four rafters B fit into the intersection of rafters A, as shown in Fig. 3 (an enlarged section through H-T, Fig. 1).

To Lay Out Rafters

Lay the stock to be used for the rafter on the lay-out as for rafters A. The bottom is the same bevel cut against the plate as at G. Mark the top for the extreme length on the center line as at C, producing the plumb line on the side of the rafters as at C, Fig. 4.

To determine the cutting length, measure the distance C-B, Fig. 3, and transfer this distance to the side of the rafter, measuring back on a level line from the extreme length as at C and produce plumb line B, Fig. 4, squaring across the top edge and locate the center.

To make a fit into the corner against the sides of rafters A, measure back on level line from plumb line B, a distance equal to one-half the thickness of the stock used for the rafter. Produce plumb line A. Square across the top edge of the rafter and connect the points as shown on the top view, Fig. 4.

To Assemble the Rafters

Assemble the rafters as shown in Fig. 5. Set up the rafters A first, securely nailing them and then rafters B, fastening them well at the plate and against the four main rafters. Mark the stations on the rafters locating the positions of the sweeps, taken from the lay-out. Fit the sweeps in between the rafters and the roof is ready for the sheathing.

Determining Shape of Sheathing

To find the exact shape and bevels for the outside covering or sheathing boards, divide a section of the plan between center lines on the inside line of the sheathing into a number of equal parts, as 1, 2, 3, 4, 5 and 6. These distances should be equal to the desired width of the stock to be used for the sheathing.

The sheathing should be as wide as possible, according to the sweep of the plate. If the sweep is flat, the sheathing can be wider than for a quick sweep, otherwise it may be necessary to hollow out the back of each piece in order to have it ride properly on the frame work, and considerable dressing may be avoided in finishing the outside surface of the sheathing if narrow stock is used.

The length of the sheathing is determined by developing the curve of the roof on the rafter line or back edge of the sheathing. Project the top edge of the rafter up until it intersects the center line as at Q. With Q as a center and radius Q-U draw part of a circle. With Q as a center and radius Q-V draw another part of a circle, giving additional length for the projection.

On the first curved line lay off two points X-Z, a distance apart equal to two divisions marked off on the plan showing the width of each piece of covering as No. 1, X-Z. Connect these two points with Q and continue the lines down to the bottom of the projection, as shown in the section of the height, Fig. 1. This gives the exact shape and size of sheathing to cover the roof, make a pattern and lay out 48 pieces required.

The measurements have all been taken on the rafter line or inside edge of the sheathing which gives the minimum size to cut the covering which insures a tight joint on the inside. This will leave the outside joint open a little, which is all right.

If the joint is to be a tight fit, the edges must be beveled, making the outside of the sheathing wider than the inside, due to the fact that the further away from the center the greater the circumference. To determine this bevel, connect one of the divisions on the plan with the center, as shown in Fig. 1, division 3. Draw a straight line from the edge connecting the two joints on the face of the sheathing. Set the bevel square to bevel W, Fig. 1. Bevel the edges of the sheathing to fit, making the sheathing the amount of the bevel wider then the pattern, used in laying out the stock. Sheath or cover in the roof, as shown in Fig. 6.

Removable Steel Forms

(Continued from page 44)

with one movement. They replace numerous items of material and labor required by other systems, and therefore constitute a great labor-saving device.

All the lumber necessary for the erection of the steel forms consists of shores or posts and stringers, which also become plant and, being of standard sizes, 90% of these can be salvaged and used on various jobs until the life of the lumber is destroyed. This lumber can be shipped from place to place, which has been done on several large jobs.

The shores are 4 x 4 scantling with a 4 x 4 cross piece braced at the top. The outside stringers are 2 x 8s of stock lengths and never cut as they are allowed to lay—which is an important point. The middle stringer is a 3 x 8 and supports the floor after the outside stringers have been removed.

In other systems most of the lumber somewhere in the method must butt up end to end. That is, it must be cut to exact lengths. Every time you cut you pay wages and waste lumber. If it is to be used on another job it is certain it will not fit as it will probably be too short and is generally considered of no value for another job. Therefore the lumber is material and not plant. The only waste being the small amount of bracing which is common in every system, but even this is reduced considerably.

The photographs herewith show the assembling of the form with the shoring ready to receive the forms. The forms were stripped from three to four days after pouring.

The above building is the Patrick Henry School at Cleveland, O., and the forms were furnished and erected by the Building Products Company of Toledo, Ohio. They also furnished the reinforcing steel and lathing. The Drummond Miller Co. were the builders.

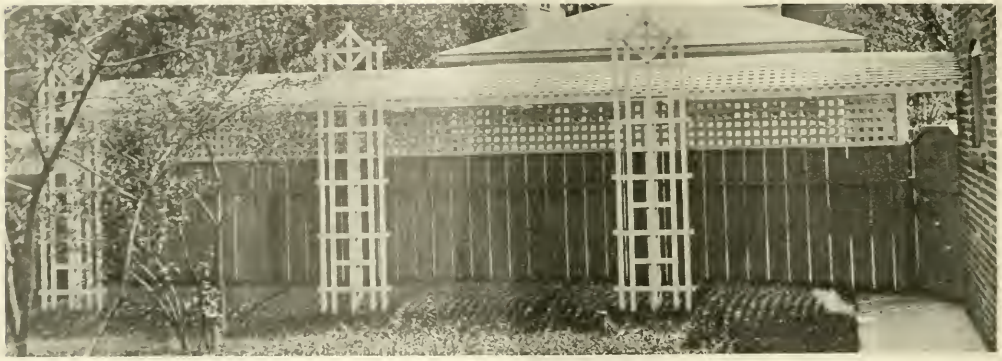
These forms are now being used on several buildings throughout the country with the best of success, and this is merely a beginning of using removable steel forms in the building construction.

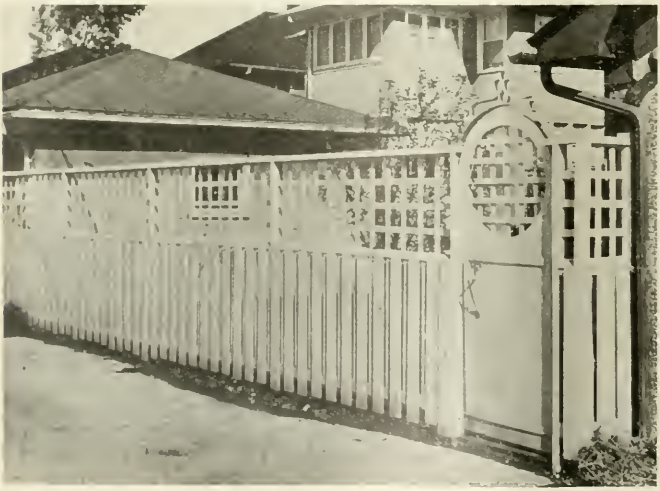
Back Yard Fences

THE building of a fence to enclose the backyard is generally left entirely to the building contractor. Too often but little thought is put on this design, either it is a plain board fence or pickets.

Now, the back fence can be made attractive as well as other parts of the house. In the majority of cases the housewife looks out of the back windows more often than the front, therefore, why should she not have something pleasant to view?







The several illustrations in this article will serve as suggestions of what can be accomplished at a low price. There is nothing hard or elaborate about any of these designs and still they are all pleasing.

Try to give your customers something along this line, get them to speak about your artistic work. While a fence of this sort will cost a little more money, the home owner will not object to it, so long as it will give him something better than he expected.

Suggestions for Profitable Work in Spare Time

What the Editor Thinks

Safety in Construction

EVERY now and then we hear of some accident where workmen or passers-by are killed or badly injured by having building material fall on them while it is being hoisted. Too much care cannot be taken for safety in this matter, especially in cities where all of the operation is done on the sidewalks with the public passing by.

A good rule to follow where the building is more than three stories high is that no material for such construction should be hoisted or lifted outside of such building. It may seem a little more work to do the hoisting inside, but it is more safe and will prevent accidents and lawsuits.

Quite a number of the accidents occur due to the breaking of the ropes which are used in the hoisting. The greatest danger seems to exist in the use of slings. Rope slings are easily cut by the sharp corners of building material; they simply wear away and unless examined carefully they will be used on some lot of material which will drop when the rope parts.

Material is often pulled along the ground before it is hoisted vertically. This saves a lot of time, but care should be taken that there is no obstruction in the way for the load to catch on. It is hardly expected that a rope can pull over the side of a building, but that seems to be the object of some laborers who are supposed to be directing the passage of the load. A terrific strain is put on the rope and it is not surprising that afterwards it will part even with a lighter load.

The hoisting of material needs intelligent direction, the same as the construction end of the building business. One thing that should be entirely eliminated is the habit of workmen riding up with a load. If the hoisting of steel beams, etc., on a skeleton building was generally done from the inside, there would not be the same incentive for workmen to take a thrilling ride. We all like a gallery to see us do a stunt and without an audience there is no fun in doing it.

Success in the Building Business

THERE are four basic essentials which every builder should strive to study and excel in, so as to make a success as a building contractor. These are the handling of equipment, the handling of materials, the handling of men, and the handling of accounts. All of these subjects form a big study and experience in each department will be the best teacher

Equipment should be taken care of, it will last longer and give better results. Materials should be ordered and placed on the job so that they can be readily found and placed in position. One of the hardest jobs an employer has to contend with is the handling of men. Good men will only work under good conditions; they do not like to be yelled at, and more or less want to be left alone in their work; supervision is one thing —nagging is another.

Every business to be successful must make money, and it is quite a job to keep the money coming in so as to keep everything going smoothly. Pay day comes around quickly and the men expect their money. A wise contractor must figure ahead so that he will have the money on hand. If payments will not come for some time, other means to get the necessary money for payroll and to meet current bills must be arranged for. Finance is the life blood of any business and especially so in the building business.

Home Building in 1922

THE Spring building season is only a few weeks off. Many thousands of people have been dreaming of the beautiful home they intend to build some day. It is their ideal, but year follows year and the joys of the new home have never been realized.

The practical builder who is anxious to increase his business will use all means available so as to induce people to build. There is more to be done than just mere suggesting that they should own a home. Practically every one has that desire, but the great stumbling block is to be able to finance it successfully.

Building Comfortable Homes

THERE are many little things that go to make a house comfortable that are too often overlooked by the builder. A home is not a true home unless every comfort is afforded the occupants.

Think a little about how doors swing; many doors are hung in the wrong way, they should swing so that they will give the most convenience. There is no great harm in having a door open into a hall instead of opening into the bedroom or bathroom side where the space inside is limited. We do not open a closet door inwards and there is no objection to it; therefor, why persist in having all doors open into a room when it will mean more convenience to have them open outward? Closet doors should open so that the light from the window or chandelier will not be obstructed when the door is open.

The height of the windows is another important little point that is frequently over looked. Try to ascertain the wishes of your clients. A table is used in most kitchens and too often a window is set too low so that the top of the table is above the bottom of the window, if you have your window sill about 32 inches above floor level it will be about right, and one fault too often found in kitchens will be overcome.

Another point to look out for is to have the lock on the door at a convenient height, often we find it too low for convenience.

Be particular about the little details so as to produce pleasing and artistic exteriors. The trim for doors and windows and other details such as cornices, roof fittings, lattice work, etc., are what makes the appearance of the house. Have the workmanship on these small details exceptionally good.

These are just a few suggestions to impress builders with the importance of looking after the little details of construction, as these are what please the customer and a pleased customer is the best advertisement a builder can have, also it means obtaining the worth while contracts.



View Looking Towards Stage, Showing Wreckage of Roof and One of the Collapsed Trusses. The Hollow Tile Walls Held Up, Showing That Fault Was With Roof Only

COLLAPSE OF THEATRE ROOF

Awful Disaster in Washington Shows the Need of More Knowledge and Care in Design and Construction of Public Structures

LAST month we published a description of the catastrophe of the American Theatre in Brooklyn, N. Y., which collapsed while it was under construction. In this article we mentioned it was providential that it occurred during construction and not after it was opened for business, and we pictured the awful possibilities of a collapse in a theatre crowded with an audience.

Unfortunately a horrible calamity of this sort actually occurred in the collapse of the roof of the Knickerbocker Theatre at Washington, D. C., while an audience was seated enjoying the movies. Several investigations are under way to determine the exact cause of the collapse, but at the present time it is too early to give any reliable, definite facts.

The collapse occurred at 9:20 P. M. on Saturday, January 28th. A severe snowfall of 29 inches had occurred during the day and the most accepted theory is that the weight of this snow was enough to cause the collapse. On the same Saturday the roofs of two other buildings in Washington collapsed from the weight of snow, one being a church and the other a garage, but these disasters were not accompanied with the loss of life as was that of the theatre.

In our January issue we called particular attention that proper care should be taken in the design and construction of roof trusses, etc., over public buildings. Surely the public has a right to be protected from disasters of this nature.

Why would it not be a good plan to actually test roofs, balconies, floors, stairs, etc., of buildings that are occupied for public use? Experimental tests are often made on a small scale, but there is no reason why it should not be carried out on a larger scale and have safety assured. A cantilever balcony could be tested by having one section of it loaded up with pig iron or any other heavy material. Have it evenly distributed so that it will actually be a distributed floor load. If this load be made twice that of the estimated weight which has been calculated to be allowed on it when in use, it can be considered safe. No steam boiler is allowed to be used until it has passed a hydraulic test of a pressure greater than its allowable working pressure. Why could not the same good rule be applied to public buildings?

The Knickerbocker Theatre was

located on Columbia Road in the Northwest Section of Washington. It was erected in 1917 from plans prepared by R. W. Geáre, architect, of Washington. The walls were built of hollow tile with roof supported by steel trusses, the ceiling being suspended in the regular way from the bottom members. The ceiling was of plaster on metal lath and was ornamented in the manner usually found in high-class modern fire-proof motion picture theatres.

The theatre was located in one of the best residential sections of Washington, and amongst the unfortunate victims of the disaster were many people prominent in Washington life. At the time of our going to press 96 people lost their lives with over 130 more or less injured.

The pictures we present show the extent of damage by the collapse, also the form of construction. Many theories have been advanced as to the actual primary cause of the disaster, some have advanced the theory we propounded in our January issue that rhythmatic vibrations may have been the cause.

One interesting theory advanced is based on the fact that the girl organist had just concluded the solo of the intermission between the first and second performances. It is said that the great organ rumbled the finale in strong tones that vibrated through the structure.

The weight of snow is a factor that must always be carefully considered in the design of a flat roof of wide span, and to make sure, the calculations for the strength of the roof should take into consideration those various occasional forces that are apt to come and then a large enough factor of safety used; in other words, the structure should be made strong enough to withstand five or more times the load that has been calculated as the likely load it is to bear, not only the dead load but all possible live loads.



The Only Portion of the Reinforced Concrete Balcony to Partially Remain. One of the Rool Trusses Shown at Bottom of Picture; Note Its Crumpled Condition.

It is certain that no adequate factor of safety was employed; these few pictures are mute but forceful evidence that some awful blunder was made, otherwise a little overload would not cause such a complete collapse.

R. W. Geare, the architect who designed and supervised the construction of the Knickerbocker, declared that he could not account for the collapse.

"I am at a loss to understand what caused the building to cave in," he said. "The theatre was built before the war and the best of materials were used in constructing it. A most thorough inspection was made before it was opened."

Harry M. Crandall, president of the corporation controlling the Knickerbocker Theatre, and A. E. Beitzel and Harry Buckley, officers of the theatre, issued a joint statement They expressed themselves as stunned. They added:

"The Knickerbocker is the prize of our circuit. Constructed at no limit of cost before the war, when the best material and engineering brains were secured to make this house a model for theatre architecture and construction The structure was subject to and passed every municipal government inspection and test."

"We cannot find words to express the depth of sympathy we feel for those bereaved by this appalling catastrophe."



Another View of the Remaining Portion of the Balcony, Showing the Construction, the Cantilever Extended Out to the Next Twin Pilasters. Photos by Underwood.

Review of Building Situation

CONSTRUCTION activity in December, according to figures published by F. W. Dodge Co., show that the total amount of contracts awarded (not contemplated) amounted to $198,518,300. This is 3% over the November total, but it is 98% greater than the figures for December, 1920! It is the second largest December total on record, and this is certainly a most encouraging sign for building activity this year.

In all districts a substantial increase was shown over that of December, 1920. Despite this good showing in December, however, the year closed with 8% less contracts in money value than 1920. There was, however, more building in 1921 than in 1920, the lowering of costs of material and labor is the reason for this.

Despite lower costs the district around New York spent 7% more money on construction in 1921 than in 1920 and in the Middle Atlantic district the figures are 18% ahead of 1920. There is considerable building on the West coast, the principal amount being around Los Angeles, which is now having a boom, with the exception of Southern California the West and Middle West districts ran behind the 1920 totals.

In the contracts awarded residential building continues in the lead, showing an increase of $10,572,800 over that of November contracts. The total amount of contracts awarded for residential construction is $100,896,700 and $73,527,300 of this amount is to be spent in the Eastern district; that is, New England, New York and Middle Atlantic States.

A great many of the above contracts awarded will not be started until this Spring, or as soon as the weather permits. On account of mildness of the winter in some sections, considerable work has already been started.

1922 Building Activity

THE greatest building activity in this country this year will be in the industrial states, according to a forecast of the building outlook recently made by the Committee on Statistics and Standards of the Chamber of Commerce of the United States.

It is pointed out by the Committee that there will be a good many business buildings erected this year, and a large number of them will be in the shape of alterations and enlargements. On the other hand, it says, it is unfortunate that not a great many farm buildings, such as dwelling houses, barns, cribs and the like are contemplated.

The prospects for building in the strictly agricultural states is not favorable. There are several reasons for this, principally the exceedingly low and unremunerative prices on farm products.

Record of December, 1921, Building Contracts Awarded

Classification of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$2,208,400	$6,509,100	$3,430,400	$3,029,800	$6,283,500	$595,500	$22,056,700
Educational	3,496,900	2,752,000	2,168,500	2,385,700	2,971,100	1,272,000	15,046,200
Hospitals and Institutions	400,000	466,500	2,671,500	809,400	1,914,000	82,000	6,343,400
Industrial	966,700	3,857,100	3,774,000	2,523,400	3,020,000	411,400	14,552,600
Military and Naval	.....	30,000	18,000	50,000	5,000	26,000	129,000
Public Buildings	298,300	903,000	40,000	323,100	208,800	370,000	2,143,200
Public Works and Utilities	953,100	1,353,100	7,518,300	2,770,200	12,320,300	2,917,800	27,832,800
Religious and Memorial	439,000	676,800	636,600	719,000	856,000	41,400	3,368,800
Residential	17,358,700	44,071,500	12,097,100	8,640,100	16,382,400	2,346,900	100,896,700
Social and Recreational	353,000	1,711,500	568,400	1,202,000	1,934,000	380,000	6,148,900
Miscellaneous	.....	.....	.....	.....	.....	.....	.....
Total	$26,474,100	$62,330,600	$32,922,800	$22,452,700	$45,895,100	$8,443,000	$198,518,300

Building Projects Contemplated December, 1921

Classification of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$4,843,900	$9,627,700	$10,625,600	$9,755,300	$14,069,000	$1,431,000	$50,352,500
Educational	4,586,100	6,462,600	4,286,000	4,036,500	44,326,400	1,450,500	65,148,100
Hospitals and Institutions	365,000	3,210,800	907,500	2,201,000	3,130,000	41,000	9,855,300
Industrial	3,323,200	4,330,800	2,792,400	6,406,400	12,631,000	2,932,900	32,416,700
Military and Naval	350,000	22,800	326,000	100,000	228,000	26,000	1,052,800
Public Buildings	495,000	398,100	662,500	522,000	1,141,700	270,000	3,489,300
Public Works and Utilities	4,164,000	4,393,500	6,698,700	4,645,200	64,322,600	5,997,500	90,221,500
Religious and Memorial	1,406,000	1,612,000	1,662,100	1,142,000	5,200,000	561,400	11,583,500
Residential	9,482,400	52,431,600	22,634,000	14,337,900	37,094,200	4,059,100	140,039,200
Social and Recreational	2,321,500	2,491,000	3,106,500	1,554,000	11,269,500	478,500	21,221,000
Miscellaneous	.....	.....	.....	.....	.....	.....	.....
Total	$31,337,100	$84,980,900	$53,701,300	$44,700,300	$193,412,400	$17,247,900	$425,379,900



This Book Free

If you are interested in building a garage (and who is not in these days of automobiles?), you will find a number of valuable suggestions in The National Garage Book, which we want to send you without charge.

The principles, methods and practice of scientific construction of garages to secure beauty and practical utility, together with ease in opening the doors and the fullest protection against all sorts of weather, are completely set forth in this book.

In this book photographs of garages are shown in practically all kinds of structural materials; such as wood, brick, concrete, stucco, and stone. The garages shown cover a wide range, from those of simple design to those of more elaborate proportion.

National Garage Hardware

the equipment illustrated in this book, is essentially practical, has been thoroughly tested under all conditions, and will give long and satisfying service.

Tear out blank now

National Manufacturing Company

Sterling, Illinois

National Manufacturing Company,
Sterling, Illinois.

Gentlemen:

Without any obligation on my part, please send me a copy of your Garage Book, referred to in BUILDING AGE.

Name

Local Address

City and State



Legal Department

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age, 920 Broadway, New York City.

A COLORADO subscriber, who recently consulted us concerning his right to compensation where he furnished plans, etc., for a church structure, but they were not used for some years, and where he did not have any distinct understanding with the church corporation or its building committee concerning his compensation, supplements his inquiry by stating that the building committee now offers to pay $50, and by saying: "I am preplexed as to what under the circumstances is best to do: accept the ignominious offer in self and professional abasement and lay the incident up against experience or sue for a just compensation. I deeply appreciate your counsel and careful advice and would be still grateful for one more word."

To Sue Or Not to Sue; That is the Question

Unless a reliable attorney in the city where our friend resides is willing to assure him that there is a good prospect of recovering at least $200 above attorney's fee, expenses of the litigation, etc., I am strongly inclined to advise taking the $50, "and lay the incident up against experience."

As stated in our previous answer to this correspondent, it seems that failure to obtain a distinct written contract with the building committee, and other circumstances, create some doubt in our mind as to whether recovery could be enforced. Acceptance of the $50 will avoid considerable worry and expense, necessarily incident to preparing and attending the trial.

It may sound strange to hear a lawyer say it, but the law editor of THE BUILDING AGE is not deeply impressed with the merits of litigation as a means of venting an aggrieved person's desire for "satisfaction" against one who has dealt unfairly. When we think of "lawing for principle" we always think of the Italian vender of plaster statuettes who resented an affront to the memory of the patriot, Garibaldi. Carrying on his arm a basket containing figures of the world's greatest men, the Italian met on a New York sidewalk an American staggering under a load of intoxicants, and said, "Buy a statue of Garibaldi." The soused one, seizing the cast from the vender's hand, dashed it to the pavement, saying, "To hell with your Garibaldi." Whereupon a volcano of resentment burst from the Italian, who, seizing out of his own basket a cast of the immortal George Washington, dashed it into a hundred pieces on the sidewalk, indignantly shouting, "You say to hella with my Garibaldi. I say to hella with your George Wash."

I do not share the pessimism which believes that if a lawsuit happens to be decided in accordance with equity and justice the result is to be attributed more to chance than to any merit of law or the courts. But I do think that, as applied to controversies which involve but small sums of money, there is much in what Feltham said:

"To go to law, is for two persons to kindle a fire at their own cost, to warm others, and singe themselves to cinders; and because they cannot agree, to what is truth and equity, they will both agree to unplume themselves, that others may be decorated with their feathers."

Those who have had litigious tendencies may agree with what Douglas Jerrold remarked: "The law is a pretty bird, and has charming wings. It would be quite a bird of paradise if it did not carry such a terrible bill."

I approve Quarles' advice that one should "use law and physic only for necessity; they that use them otherwise abuse themselves into weak bodies, and light purses; they are good remedies, bad businesses, and worse recreations."

If "satisfaction" is desired where a "religious" congregation refuses to pay an architect's bill and the amount involved is too small to justify litigation, we suggest that the parson be asked to preach a sermon on one of the following texts:

"For the congregation of hypocrites shall be desolate, and fire shall consume the tabernacles of bribery." Job, xv. 34.

"Nay; but I will verily buy it for the full price: for I will not take that which is thine for the Lord, nor offer burnt-offerings without cost." I. Chron. xxi. 34.

"Because he hath violently taken away a house which he builded not; surely he shall not feel quietness in his belly." Job xx. 19, 20.

QUESTION is frequently raised as to whether a building contractor has substantially performed a contract in such sense as to be entitled to recover compensation, although in some respects the work may be defective or incomplete.

Substantial Performance Of Building Contracts

This question was raised before the California Supreme Court recently in the case of Rischard vs. Miller, 188 Pacific Reporter, 50, and was decided in favor of the builder. The court lays down the following rule generally recognized by courts throughout the country:

"If there has been no willful departure from the terms of the contract, and no omission of any of its essential parts, if the contractor has performed in good faith all of its substantive terms, or if the omission is so slight that it cannot be regarded as an integral or substantive part of the contract and the other party can be compensated therefor by a deduction in the way of damages, the contractor may recover whatever is due upon the contract less such deduction, especially in a case where the other party has received the benefit of what has been done, and is enjoying the fruits of the work."

In the California case it is found that there was a substantial performance of a contract for the erection of a house



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For the convenience of architects, builders and construction engineers, we have recently issued two Redwood booklets, our "Construction Digest" and our "Engineering Digest". They will be forwarded to you on request.

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Including—Colonial siding, clapboards, shingles, door and window frames—gutters, eaves, water tables and mudsills—porch rail, balusters and columns—mouldings and lattice—pickets and fencing—pergolas and greenhouses.

Interior Finish

Natural, stained or painted

Industrial Uses

Tanks and vats for water, chemicals and oil—factory roofs and gutters—wood block flooring.

Wood Specialties

Such as—Caskets and burial boxes—incubators and ice-cream cabinets—cigar and candy boxes, etc

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Such as—Railroad ties and tunnel timbers—signal wire conduits and water tanks—car siding and roofing.

Farm and Dairy Uses

Such as—Silos, tanks and troughs—hog feeders and implement sheds—wood block floors, etc.

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at a cost of $2,000, where the defects were remediable at an aggregate cost of about $100 and were of the following described nature: Defect in a concrete foundation wall remediable at a cost of $25. Settling of a pillar, which could be corrected for $10. Variance in size of glass in a cabinet door, curable for $3.50. Piping not as large as specified, but subject to correction for $25. Hat cupboard omitted but obtainable for $5. Substitution of No. 2 flooring in one room for No. 1, but not noticeable excepting on close inspection.

In another recent case it is held by the Court of Appeals of the District of Columbia that on intentional failure of a contractor to observe building specifications, the owner may deduct the entire cost of making the building conform to specifications, and is not required to deduct merely the difference between the value of the work as done and its value if it had been performed as required by the contract. (Turner vs. Henning, 262 Federal Reporter, 637.)

Plaintiff sued to enforce a mechanic's lien for a balance due for constructing a house. The defense consisted of a denial that the building had been erected in conformity to the contract. The trial court found that certain parts of the work did not comply with the agreement, and allowed a deduction from the price to cover reconstruction of those parts. The Court of Appeals affirmed the decision, saying:

"The testimony of the architect, supported by that of several other competent witnesses, satisfies us that the contractor intentionally failed in the respects mentioned in the decree. This is illustrated by the following instances: The specifications called for a concrete floor in the cellar, consisting of a one-inch topping with a three-inch base, making four inches in all. But the floor laid did not have an inch topping and measured only from 1½ to 2½ inches in total thickness. Upon little pressure a pick punctured the surface. If the floor was constructed as the contract required, the pick 'could not have made any more than just a slight impression, and sparks would have responded from the pick,' said the architect of more than thirty years' experience. 'The porch' of the building, testified the architect in charge, 'was to be finished with a master builders' preparation for a red top, but when it was finished it lacked the coloring. It was mottled and a dull red, not the kind he expected. . . . When completed it gave the appearance that lamp black or something else had been worked into it." . . . Appellant repeatedly refused to remedy these defects.

"Under his state of the proof he is not entitled to the benefit of the equitable doctrine of substantial performance. That doctrine 'is intended for the protection and relief of those who have faithfully and honestly endeavored to perform their contracts in all material and substantial particulars, so that their right to compensation may not be forfeited by reason of mere technical, inadvertent, or unimportant omissions or defects. It is incumbent upon him who invokes its protection to present a case in which there has been no willful omission or departure from the terms of his contract." . . .

"Appellant urges that, if the work was defective, the owner should have been allowed only the difference between the value of it as done and the value of it performed in accordance with the contract. Is this sound? The owner did not want a cellar floor, nor a porch such as we have described, and he should not be required to pay for them, but this is what would result if appellant's theory as to the measure of damages is followed. Appellant did not do the things for which appellee agreed to pay him, and he should not be permitted to thrust upon the latter things not substantially the same, but much inferior, even though he is willing to let him have them at a reduced price. . . .

"It was argued that if the owner had removed the defective parts and replaced them according to the contract, he might be entitled to deduct the cost of the replacement; but, because he did not do so, but is keeping these parts and using them, he should pay their value. We cannot accede to this. Appellee [the owner], after appellant had refused to perform his contract, had his election either to use those parts or take them up and throw them away. Neither course would result in any benefit to the appellant; therefore, he could not be injured by the appellee's taking the one course rather than the other. If the latter could return to the appellant the defective things, the rule might be otherwise, but obviously he could not do so. To remove them would be to destroy them.

"To enjoy the house for which appellee had paid nearly $8,000, he was compelled to use, more or less, the defective parts. This did not work an acceptance of them, since they were negligible as compared with the whole, and he repeatedly said to the appellant that he would not accept them. Equity will not penalize him, in the circumstances, by compeling him to pay for that which he does not want."

THE Owner and Builder have signed an agreement that the work in question is to be done on a cost plus 10% basis, but that the total cost shall not exceed a certain sum. The point the Owner questions is, would he be legally obligated to the Builder for any increased prices in labor and materials, during the progress of the work, due to abnormal conditions? The work was started September, 1919, and finished approximately October 1, 1921. In signing the contract, the Builder was cautioned concerning unforeseen conditions and he understood fully the conditions that confronted him, and he included a certain amount for protection.

Who Bears Labor and Material Cost Advances?

O. J. M., Chicago, Ill.

On the facts presented, the Owner is not obligated to the Builder for any increased prices in labor and materials. It would take an express agreement to hold the Owner to such obligation. The Builder undertook to build the structure according to certain specifications for a price not to exceed the specified maximum sum. He impliedly guaranteed that a computation of the price on the cost plus 10% basis would not result in a higher figure than the maximum sum fixed. If he desired to qualify this guaranty by imposing a condition that increases in labor and material costs—whether expected or unexpected—should be used as a basis for increasing the price for the building on actual cost plus ten per cent. exceeding the maximum specified in the contract, he should have insisted on that condition being expressed in the contract.

"Where the contract contains an express stipulation as to the amount of compensation, such stipulation is conclusive on the parties, and measures the amount of recovery for performance." 13 *Corpus Juris*, 585.

"By the strict common-law rule, a builder who has improvidently assumed an absolute liability when he might have undertaken a qualified one only, is not excused from performing his engagement, unless he is prevented from doing so by reason of performance becoming impossible by a change in the law, by the destruction of the specific thing which is essential to the performance of the contract, or by the non-existence of conditions essential to performance. *No hardship, no unforeseen hindrance, no difficulty will excuse him from doing what he has expressly agreed to do.* Thus a contractor is not excused from performing, according to the terms of the contract, because of defective or mistaken plans, of mere difficulty in performing, *or of unusual or unexpected expense;* or because of his inability to perform, not due to any wrongful act or omission of the owner; or because the contract would not be profitable to the owner, or would be useless under the existing conditions; nor is he excused because of latent defects in the soil conditions, unless the testing of the soil is exclusively within the control of the owner or architect. . . . A contractor's mistake in supposing that no license was required to work where he desired to is no excuse for his failure to perform." 9 *Corpus Juris*, 805-806.

It is really immaterial whether either party to this contract foresaw the possibility of labor costs and material prices advancing. But, of course, the fact that the Builder was cautioned by himself or some one else to take heed of the possibility of costs and prices mounting higher, is a circumstance in the Owner's favor.

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Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	Dec. 23	Jan. 25
LONG LEAF YELLOW PINE		
B. and Better Edge Grain Flooring, 2¼" Face	$81.00	$81.00
Dimensions, S1S1E, No. 1 Common, 2x4", 10'	40.00	40.00
Timbers, Merchantable, '05, 12x12", 10 to 20'	49.50	49.50
B. and Better Ceiling, ½x3¼	32.50	32.50
B. and Better Finish, 1x4"	64.00	64.00
No. 1 Common Boards, 1x8"	42.00	42.00
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13 16x2½"	$67.00	$67.00
Reefers, 13/16x5½"	29.00	29.00
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3"	$78.50	$78.50
No. 1 Clear V. G. Flooring, 1x4"	76.00	76.00
No. 2 Clear and Better Ceiling, ⅝x4"	43.00	45.00
No. 2 Clear and Better Novelty Siding, 1x6"	52.25	52.25
No. 2 Clear and Better V. G. Stepping	90.12	90.12
Dimension, S1S1E, 2x4", 16'	40.00	40.00
Timbers, S1S1E, 12x12", 16'	54.00	54.00
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M	$7.60	$7.60
Washington Perfection Shingles, per M	7.20	7.20
Clear Bevel Siding, 1½x6"	44.50	43.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½"	$8.25	$8.25
Dimension, 2x4", 10 to 16'	34.00	34.00
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2x2¼"	$147.50	$160.00
Clear Plain White Oak	106.25	115.00
Clear Maple, 13/16x2¼"	95.50	96.50
Clear Quartered White Oak Parquetry Strips, 5/16x2'	142.50	142.50
Clear Plain White Oak Parquetry Strips	87.50	87.50
(All lumber prices furnished by LUMBER MERCHANT)		
COMMON BRICK—		
Per M. f. o. b. job	$17.50	$18.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered	$2.35	$2.30
STRUCTURAL STEEL (IRON AGE)—		
Per 100 lb. to large buyers	$1.98	$1.88
CRUSHED STONE (cu. yd.)—		
¼ in.	$2.80	$3.00
1½ in.	2.65	2.90
WALL BOARD—		
Per 1,000 sq. ft. in lots under 1,000 sq. ft.	$60.00	$60.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.	55.00	55.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered	$20.65	$20.65
2.8 lb.—24 gauge light price per 100 sq. yd. delivered	24.60	24.60
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	27.35	27.35
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag	$0.60	$0.60
Masons, per 50 lb. bag	.45	.45
SAND AND GRAVEL (cu. yd.)—		
Sand	$1.65	$1.75
¼ in. gravel	2.80	3.00
1½ in. gravel	2.80	3.00
FACE BRICK—		
Tapestry (delivered)	$45.00	$45.00
Caledonian (delivered)	40.50	40.50
Smooth Grey (delivered)	50.00	50.00
Fisk Lock f. o. b. factory	32.50	32.50
SHINGLES (per square)—		
Asphalt single	$7.90	$7.50
Asphalt strip	7.45	7.00
STAINED WOOD SHINGLES (per square, delivered)—		
16 in. Extra Clear	$10.50	$10.50
18 in. Eureka	10.60	10.60
18 in. Perfection	11.65	11.65
24 in. Royal	11.00	11.00
24 in. Imperial	11.70	11.70

CHICAGO PRICES

YELLOW PINE—		
Boards, 1x8, No. 1 Com.	$37.00	$37.00
Casing and Base, 6-8 in.	60.00	60.00
Ceiling, ⅝x4, B. and Btr.	43.00	43.00
Dimension No. 1, 2x4, 12 to 14 ft.	32.00	32.00
Drop Siding, 1x6, B. and Btr.	48.00	48.00
Finish, 1x4, B. and Btr.	61.00	60.00
Flooring, B. and Btr. E. G., 1x3	74.00	75.00
Lath, 4 ft., No. 1	7.40	6.65
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	41.00	40.00
NORTHERN HEMLOCK—		
Boards, No. 1, 8 to 16 ft., 1x6 to 8 in.	$30.50	$30.50
Lath, 4 ft., No. 1	9.75	9.75
DOUGLAS FIR—		
Boards, No. 1, S2S, ¾ in., 1x8 to 10 in.	$29.75	$29.25
Dimension, No. 1, S1S1E, 8 ft., 12 ft., 14 ft., 2x4 in.	29.50	29.50
Drop Siding, 1x6 Pat. 106, No. 2, C. and Btr.	42.50	44.50
Flooring V. G., 1x4, No. 1	68.50	68.50
Lath, 4 ft., No. 1	9.75	9.40
Timbers, No. 1 Com., 12x12 in. and under, 40 ft. and under, rough	38.50	38.50
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear	$94.75	$94.75
Oak Flooring, 13/16x2¼, Cl. Pl., White	109.00	109.00
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear	$38.25	$38.25
Finish, S2S or S4S, 1x6 to 8 in. clear	81.50	81.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear	$43.00	$43.00
Shingles, Extra Clears, 16 in.	4.50	5.00
COMMON BRICK—		
Per M. f. o. b. job	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$1.97	$1.97
STRUCTURAL STEEL—		
Per 100 lbs. to large buyers	$1.98	$1.88
CRUSHED STONE (cu. yd.)—		
¾ in.	$1.75	$1.75
1½ in.	1.75	1.75
WALL BOARD—		
Per 1,000 sq. ft. in lots under M	$57.50	$57.50
Per 1,000 sq. ft. in lots 1 M to 2½ M	52.50	52.50
SAND AND GRAVEL (cu. yd.)—		
Sand	$1.75	$1.75
¾ in. gravel	1.75	1.75
1½ in. gravel	1.75	1.75

ST. LOUIS PRICES

YELLOW PINE—		
Boards, No. 1 Com., 1x4	$31.50	$31.50
Partition, ¾x3¼, B. and Btr.	55.00	55.00
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	30.50	30.00
Finish, S2S, B. and Btr., 1x4	56.00	56.00
Flooring, B. and Btr., E. G., 1x3	73.25	73.25
Flooring, B. and Btr., F. G., 1x3	61.25	61.25
Lath, 4 ft., No. 1	6.00	5.80
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	35.00	35.00
DOUGLAS FIR—		
Ceiling, F. G., ⅝x4 in., No. 2, Cl. and Btr.	$38.25	$38.25
Dimension, No. 1, S1S1E, 2x4 in., 8, 12, 14 ft.	29.50	29.50
Drop Siding and Rustic, 1x6 in., No. 2, Cl. and Btr.	42.50	42.50
Finish, F. G., S2S or S4S, 1x4 in., No. 2 Cl. and Btr.	69.25	69.25
Flooring, 1x4 in., No. 1, Cl., V.G.	68.50	68.50
Stepping, V.G., 1¼x10 in. & 12 in., No. 2, Cl. & Btr	81.75	81.75
CALIFORNIA REDWOOD—		
Finish, S2S, Cl., 1x6 in.	$81.50	$81.50
Siding, 4 in. Bevel, 10 to 20 ft.	38.25	38.25
8 inch Colonial	66.75	66.75
8 inch Bungalow	68.75	68.75
HARDWOODS—		
Oak Flooring, ¾x1 and 2 in., Clear Qtr. White	$111.50	$110.75
Maple Flooring, 13/16x2¼ in., Clear	96.75	96.75
RED CEDAR—		
Siding, ½x6, Clear	$41.00	$41.00
Shingles, Clears	4.46	4.56
COMMON BRICK—		
Per M., f. o. b. job	$16.00	$16.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.20	$2.20
STRUCTURAL STEEL—		
Per 100 pounds to large buyers	$2.07	$1.97
CRUSHED STONE (cu. yd.)—		
¾ in.	$1.83	$1.83
1½ in.	1.83	1.83
WALL BOARD—		
Per 1,000 sq. ft. in lots under M	$60.00	$60.00
Per 1,000 sq. ft. in lots 1 M to 2½ M	55.00	55.00
SAND AND GRAVEL (cu. yd.)—		
Sand	$1.20	$1.20
¾ in. gravel	1.30	1.30
1½ in. gravel	1.25	1.25

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The adjacent column describes this kind of Ideal wall construction about which Pat is so enthusiastic.

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It's a fact, you can now produce brickwork — real-honest-to-goodness brick construction at a lower cost than less enduring and less attractive construction.

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In addition to the 8-inch wall shown, 12-inch and 16-inch thicknesses are obtained by different combinations—all simple and easily handled.

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Another book that's a wonderful aid to contractors in interesting people in brickwork is "Brick for the Average Man's Home"—72 pages. The variety of design and drawings in the 35 homes illustrated are very unusual. *For all these designs complete working drawings are available at small cost.* You'll find this a decidedly valuable book. $1.00 postpaid. Send $1.25 to the Common Brick Manufacturers Association, 1308 Schofield Building, Cleveland, and receive both books. The nominal price asked is to cover printing and distribution costs only. You'll never regret securing these valuable publications.

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The Ideal Brick Hollow Wall

Selected List of Manufacturers' Literature

FOR THE SERVICE OF BUILDERS, CONTRACTORS, ARCHITECTS AND ENGINEERS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to Building Age and The Builders' Journal, 920 Broadway, New York, or the manufacturer direct, in which case kindly mention this publication. Either the titles or the numbers may be used in ordering.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

ANCHORS—See Bolts

ARCHITECTURAL IRON WORK—See also Ornamental Metal Work

The Hughes-Keenan Company, Mansfield, Ohio.

5. *Catalog No. 5.* Contains descriptions of Pressed Steel Stairs, Ornamental Iron, Fire Escapes, Steel Door and Window Frames, Pressed Steel Toilet Partitions. 65 pp.

ASBESTOS PRODUCTS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

Ambler Asbestos Shingles. Catalog, 5½x8½ in. 40 pp. Illustrated.

Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.

Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 30 pp. Illustrated. Prices and specifications.

Ambler Asbestos Building Lumber. Catalg. 8½x11 in. 32 pp. Illustrated.

Engineers' Data Sheets. Catalog. 8½x11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.

Johns-Manville, Inc., Madison Ave. and 41st St., New York, N. Y.

Johns-Manville Asbestos Wood. Booklet. 3½x6 in. 32 pp. Illustrated. Prices, construction data. List of uses for asbestos wood.

Catalog No. 304. A treatise on the manufacture and uses of Johns Manville Building Materials made of asbestos and mastic for all places exposed to fire or corrosion. 100 pp. Ill. in colors. Board covers. 8½ x 11 in.

ASBESTOS ROOFING—See also Roofing

ASH HOISTS—See also Hoists

Gillis & Geogrogan, 545 West Broadway, New York, N. Y.

36. *General Catalog.* Contains specifications in two forms, (1) using manufacturer's name, and (2) without using manufacturer's name. Detail in ¼ in. scale for each telescopic model and special material handling section. Fully illustrated with photographs of actual installations and descriptive matter of same. 20 pp., 2 colors, 8½ in. x 11 in.

ASH RECEIVERS

Sharp Rotary Ash Receiver Corporation, 396 Bridge St., Springfield, Mass.

Catalog E. Booklet describing the Sharp Rotary Ash Receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6 x 9¼ in.

Catalog F. A booklet for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with tables of dimensions for installation. 8 pp. Ill. 6 x 9¼ in.

BALANCES, SASH

Caldwell Mfg. Company, The, Rochester, N. Y.

Suggestions for the Present-Day Architect. Booklet. 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.

Pullman Mfg. Co., Rochester, N. Y.

Catalog describes new form of sash balance that can be removed and inserted without removing sash from window.

BAND SAWS

American Saw Mill Machinery Co., Hackettstown, N. J.

Catalog No. 22 describing a general line of band saws of various sizes.

Technical Data. Four-page folder 8½ x 11 in. containing specifications, description, prices and approximate cost of installation. Everything the architect or contractor requires. Proper size for filing.

BAR BENDERS AND CUTTERS

Koehring Company, Milwaukee, Wis.

Four-page folder, giving illustrations and sizes of Koehring Bar Benders and Cutters.

BEDS

Murphy Door Bed Company, Majestic Bldg., Chicago, Ill.

BOILERS—See Heating Equipment

BOLTS

National Lead Company, 111 Broadway, New York, N. Y.

Cinch Bolt Booklet. An illustrated booklet of Cinch Bolt Specialties. 20 pp. 3½ x 6¼ in.

BOOKS

American Technical Society, Chicago, Ill.

Architectural House Planning Service Co., 20 So. 18th Street, Philadelphia, Pa.

Arrow Book Company, 347 Fifth Avenue, New York City.

U. P. C. Book Company, 243 West 39th Street, New York City.

Frank R. Walker Co., 220 E. Archer Ave., Chicago, Ill.

Western School of Estimating & Plan Reading, Inc., 210 West 13th Avenue, Denver, Colo.

BRICK

American Face Brick Association, 110 South Dearborn St., Chicago, Ill.

The Story of Brick. Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Size 7 x 9¾ in. 56 pp.

A Manual of Face Brick Constructoin. The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions and illustrated and described. Size 8½ x 11 in. 116 pp. Price $1.00.

The Home of Beauty. A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8 x 10 in. 72 pp. Price 50 cents.

Architectural Details in Brickwork. An indexed folder case to fit standard vertical letter file, containing thirty-two half tones in brown ink on fine quality paper. The collection is an inspiring aid to all designers.

Bradford Brick Co., 2 Main Street, Bradford, Pa.

70. *"Red" Catalog.* 7 5/16x5 in. 30 pp. Illustrated. Covers dry pressed and impervious smooth-faced brick.

Common Brick Manufacturers' Association of America, 1309 Schofield Bldg., Cleveland, Ohio.

Brick For the Average Man's Home: Book. 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00. Illustrated. A manual for the brick builder on estimating and details of brick construction. Price 25c.

Brick—How to Build and Estimate. Book. 8½x11 in. 48 pp.

Fiske & Company, Boston, Mass.

Tapestry brick, other grades of front brick. Manufacturers of "Fisklock" Brick.

BUILDING CONSTRUCTION—See also Garage Construction

Concrete Engineering Co., Omaha, Neb.

80. *Handbook of Fireproof Construction.* An illustrated treatise on the design and construction of reinforced concrete floors with, and without, suspended ceilings. The Meyer Steel-form Construction is emphasized and tables are given of safe loads for ribbed concrete floors. 40 pp. Ill. 8½ x 11 in.

National Manufacturing Co., Sterling, Ill.

Truscon Steel Company, Youngstown, Ohio.

85. *Truscon Floortype Construction.* Form D-352. Contains complete data and illustrations of Floortype installations. 16 pp. Ill. 8½ x 11 pp.

86. *Truscon Standard Buildings.* Form D-398. Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8½ x 11 in.

87. *Truscon Building Products.* Form D-376. Contains a brief description of each of the Truscon Products. 112 pp. Ill. 8½ x 11 in.

88. *Modern School Construction.* Form D-395. Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill. 8½ x 11 in.

BUILDING HARDWARE—See Hardware

BUILDING STONE—See Stone, Building

BUILT-IN CLOTHES HANGERS

Knape & Vogt, Grand Rapids, Mich.

BUNGALOW AND SMALL HOUSE PLANS

American Face Brick Association, 110 South Dearborn St., Chicago, Ill.

Four booklets of small houses from 3 to 8 rooms, containing 98 reversible designs. (1) 3-4 rooms, (2) 5 rooms, (3) 6 rooms, (4) 7-8 rooms; size 8½ x 11 in. Each booklet 25 cents, set $1.

Keith Corporation, 533 Abbay Bldg., Minneapolis, Minn.

Twelve different plan books at $1 each. Cottages, bungalows, two-family, garages, etc.

Architectural House Planning Service Company, 20 South 18th Street, Philadelphia, Pa.

Fifty Small Homes of Character. Price $1. Working drawings, specifications and models of small homes.

CAFETERIA EQUIPMENT

Albert Pick & Company, 208 West Randolph St., Chicago, Ill.

100. *Equipment for Restaurants, Cafeterias and Lunch Rooms.* (Book BIH1.) 16¼ x 11 in. Illustrated. 86 pp. Shows practically everything required for the modern eating-place, with articles on the planning of cafeterias and other types of eating-places.

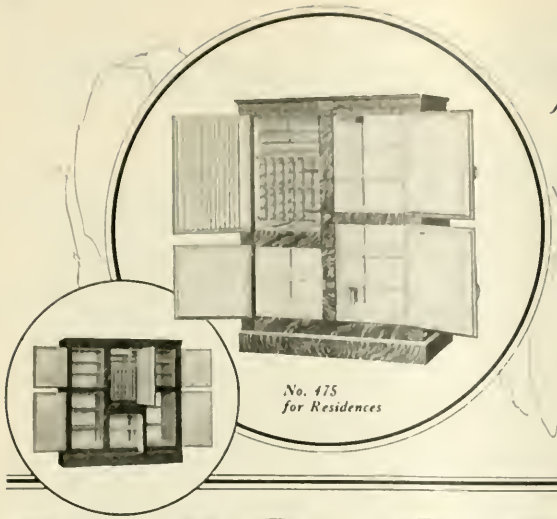
101. *School Cafeterias.* (Book BH-131.) 16¼x11 in. 44 pp. Illustrated. Deals with the principle and practice of school feeding, including the co-ordination of domestic science room with the school eating-place. Numerous floor plans of representative installations.

CANVAS

Williams L. Barrel Company, 50 Leonard Street, New York.

Consertex Canvas Roofing and Deck Cloth. Catalog A-1—Roofing Facts and Figures. Consertex is a specially waterproofed and treated roofing canvas guaranteed wear and rot-proof for decks, piazza floors, sleeping balconies, sun parlos, etc., etc.

John Boyle & Co., Inc., 112 Duane Street, New York.



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Devotion to every detail of the problems of refrigeration for more than thirty years has developed the McCray refrigerator of today, recognized as standard equipment for all purposes.

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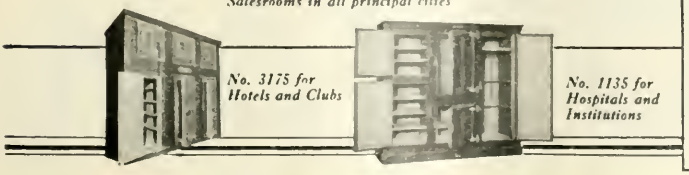
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- ... No. 64, for Meat Markets

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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 72*

CASEMENTS—See Doors and Windows

CAULKING AND GLAZING COMPOUND

All Metal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill. Illustrated catalog sent on request.

CEILINGS, METAL

The Edwards Manufacturing Company, Cincinnati, O. Pamphlet of 32 pages, describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 io.

Keigbley Mfg. Co., 124 Third Avenue, Pittsburgh, Pa.

CEMENT

Alpha Portland Cement Company, Easton, Pa.
Alpha Cement—How to Use It. Handbook 6 x 9 in. 96 pp. Illustrated. A practical handbook on popular forms of concrete construction, including form work, proper proportions in mixing, waterproofing, colored concrete, etc.
Alpha Service Sheets and Bulletins. Special suggestions on the construction of Industrial Housing, Garages, Inclosure Walls, Steps, Sidewalks, Barns, Silos, Farm Buildings, etc.
Alpha Aids. A bi-monthly magazine for those who buy, sell or use Portland Cement, sent complimentary to approved names.

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.
The Atlas Handbook on Concrete Construction. A text book written for the average builder in concrete and from the practical rather than from the technical standpoint. Treats on both plain and reinforced concrete. 144 pp. 4½ x 7 in. Cloth bound. Price $2.00.

Koehring Company, Milwaukee, Wis.
Concrete—Its Manufacture and Use. Book. 4½ x 7 in. Illustrated. 207 pp. Comprehensive discussion from the practical standpoint of concrete.

Lehigh Portland Cement Co., Chicago, Ill.

Portland Cement Assn., Chicago, Ill.

CLAMPS

James L. Taylor Mfg. Co., Poughkeepsie, N. Y.

COLUMN AND BEAM COVERING

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill. 32-page booklet, 8½ x 11. Pyrobar Tile.

CONCRETE APPLIANCES

Badger Concrete Mixer Co., Majestic Bldg., Milwaukee, Wis.
Concrete Block Machine & Mold Co., 114 South 2nd Street, St. Louis, Mo.
Catalog No. 38. 40 pp. 6 x 10 in. Building Block Machines.
Catalog No. 5. 8 pp. 6 x 10 in. Adjustable Steel Culvert Forms (NEW).
Catalog No. 11. 8 pp. 6 x 10. Steel Burial Vault Molds (NEW).
Universal Cement Mld Co., No. Milwaukee, Wis.
Van Guilder Double Wall Co., 77 South Avenue, Rochester, N. Y.

CONCRETE MACHINERY

Archer Iron Works, 2442 Mineral Street, Milwaukee, Wis.
C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
Construction Machinery Co., 403 Vinton Street, Waterloo, Iowa.
Jaeger Machine Co., 216 Dublin Avenue, Columbus, Ohio.
Koehring Co., Milwaukee, Wis.
Koebring Construction Mixers. Booklet. 7¾ x 10½ in. Illustrated. 96 pp. Complete information on construction type concrete mixers.
Koehring Dandie Mixer. Booklet. 6 x 9 in. Illustrated. 24 pp. Illustrating and describing Koehring line of Dandie light mixers.
Little Whirlwind Mixer Co., 438 Gould Street, La Crosse, Wis.
Ransome Concrete Machinery Co., 1774 Second Street, Dunellen, N. J.
Standard Scale & Supply Co., 1631 Liberty Avenue, Pittsburgh, Pa.
Republic Iron Works, Box 602, Tecumseh, Mich.

CONSTRUCTION, FIREPROOF

Bostwick Steel Lath Co., The., Niles, Ohio.
After the Fire. Booklet. 6 x 9 in. 13 pp. Illustrated. Showing the fire-resistance of Bostwick "Truss-Loop."
National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Fire Proofing Bulletin 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fireproof floor construction.
Northwestern Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Fireproof Construction. Catalog. 6 x 9 in. 72 pp. Illustrated. Handbook of practical suggestions for architects and contractors. Describing Nemco Expanded Metal Lath.
Fireproof Construction. Handbook. 6 x 9 in. 72 pp. Illustrated. Describing Kno-Burn expanded metal lath.
United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
Pyrobar Gypsum Tile. Booklet. 8½ x 11 in. 32 pp. Illustrated. Detail and specifications for fireproof partitions.
Bulletins, 8½ x 11 in., containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

DAMP-PROOFING

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
Cortright Metal Roofing Co., Philadelphia, Pa.
Illinois Zinc Co., 280 Broadway, New York.
National Sheet Metal Roofing Co., 339 Grand Street, Jersey City, N. J.
Rocbond Co., Van Went, Ohio.
F. C. Sbaldon Slate Co., Granville, N. Y.

DOOR CHECKS

Park Manufacturing Co., Worcester, Mass.
Catalog contains description of six models of the new improved Worcester-Blount Door Check.

DOORS AND WINDOWS

Andersen Lumber Co., So. Stillwater, Minn.
Architectural Catalog. An illustrated catalog showing standard styles and types of Dahlstrom hollow metal doors and interior trim. Various types of frames and other architectural shapes are also illustrated. 46 pp. 11 sections. 10 x 14 in.
Gould Mfg. Co., Oshkosh, Wis.
Hess Warming & Ventilating Co., 1201 Tacoma Bldg., Chicago, Ill.
Henry Hope & Sons, 103 Park Ave., New York.
Hope's Casements and Leaded Glass. Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¼ x 18½ in. 32 pp.
The Lunken Window Company, 4022 Cherry Street, Cincinnati, Ohio.
Lunken Windows. The Lunken Window allows a full 100% opening thus obtaining for a sash window all the merits, with none of the glaring demerits, of French windows. This booklet tells how this is done. 12 pp. Ill. 4 x 9½ in.
Baby Book of Details for Lunken Windows. One for heavy construction and one for light construction. Each book contains 20 pages of line drawings of details for use of draftsmen. Convenient pocket size. 3 x 5¼ in.
David Lupton's Sons Company, Witte and Tulip Sts., Philadelphia, Pa.
Catalog 10-LSS. 24 pp. Illustrated. 8½ x 11 in. Describing Lupton Pivoted Factory Steel Sash. Section drawings, different head and sill conditions and rules for ordering.
Catalog 10-PCS. 8½ x 11 in. 44 pp. Illustrated. Describing Pond Continuous Sash for side-walls, monitors and saw-tooth roofs.
Air and Light in Machine Shops. Catalog. 6 x 9 in. 42 pp. Illustrated. Showing the proper application of aash to machine shops.
Air and Light in Foundries and Forge Shops. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing sash types for heat-producing buildings where unusual ventilation and daylighting are required.
Morgan Woodwork Organizations, Oshkosh, Wis.
Building with Assurance. A complete treatise on standardized doors and woodwork for houses. It contains also articles by experts on Lighting, Heating, Plumbing, Interior Decorating, etc. Profusely illustrated with many plates in color. 436 pp. Flexible leatherette covers. 9 x 11 in.
S. H. Pomeroy Company, 30 East 42nd Street, New York, N. Y.
Underwriters' Laboratory Fire Retardant Windows. A valuable book containing the Underwriters' specifications for fire retardant windows; at the same time being a complete catalo of windows built to meet the specifications. 67 pp. Ill. 6¾ x 8½ in.
Reliance Fireproof Door Co., West and Milton Streets and Greenpoint Ave., Brooklyn, N. Y.
Reliance Fireproof Doors. An illustrated book showing types of doors and windows, mouldings, etc., with working drawings. 44 pp. 6¾ x 9¾ in.
Roddis Lumber & Veneer Co., Marshfield, Wis.
Roddis Flush Veneered Doors. An illustrated booklet of buildings in which Roddis doors have been used, and a treatise on Roddis Standard Construction, showing sections and diagrams of doors, as well as photographs of many types of inlaid veneered doors in color. Technical information relative to staining and finishing of doors. Size 6 x 9¼ in. 100 pp.
Truscon Steel Company, Youngstown, Ohio.
Truscon Steel Sash. This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.
Truscon Steel Sash. A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill. 8½ x 11 in.

DUMBWAITERS

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 520. Describes K. & H. Co. electric dumbwaiters. 8 pp
Kimball Bros. Co., 1106 Ninth Street, Council Bluff, Iowa.
Sedgwick Machine Works, 156 W. 15th Street, New York.
High Grade Hand Power Elevators and Dumbwaiters for All Purposes. Illustrated catalog, 52 pages; dumbwaiter service sheet, and pamphlets descriptive of many special types of outfits.
Williamsport Wire Rope Co., Williamsport, Pa.

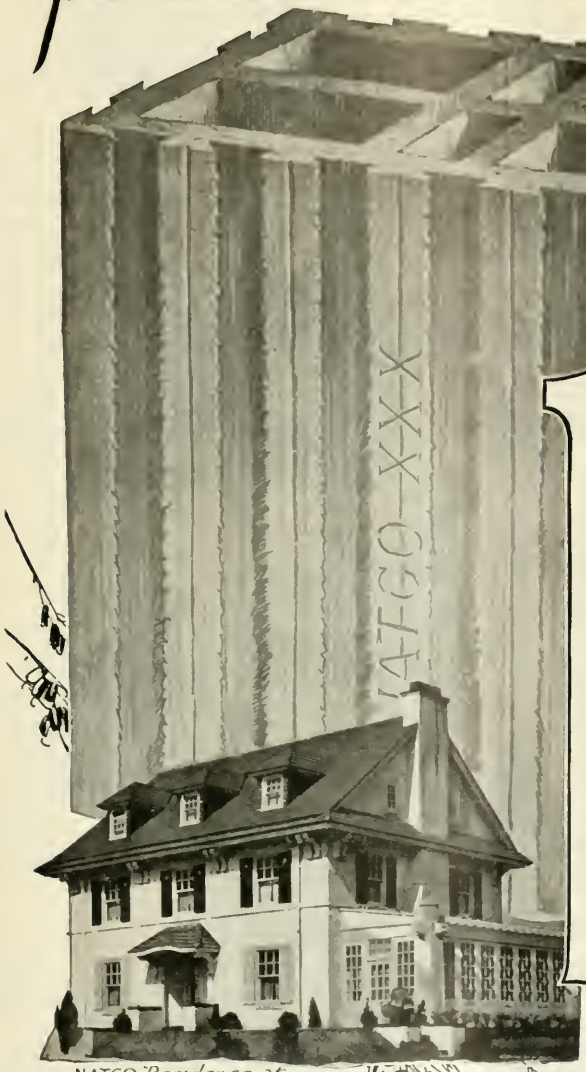
DRAFTING MATERIALS

Wickes Bros., 1301 Water Street, Saginaw, Mich.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton Street, New York.

ELEVATORS

A. B. See Electric Elevator Co., 22 Broadway, New York.
Photographs and description in detail of elevator equipment manufactured by the A. B. See Electric Elevator Co. Size 6 x 8 in.
Elevator Locks Co., 119 No. Washington St., Peoria, Ill.
A Sign of Safety. Describes devices for mechanically locking power and automatically locking gates of elevators, and control landing. Contains also list of users of this equipment. 26 pp. Ill. 4 x 9½ in.
Kaestner & Hecht Co., Chicago, Ill.
Bulletin 500. Contains 32 pp. Giving general information on passenger elevators for high buildings.

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Write for our interesting proposition today.

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1428 Fulton Building Pittsburgh, Pa.

NATCO HOLLOW TILE

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 74*

Kimball Brothers Company, Council Bluffs, Iowa.
Kimball Elevators. An illustrated catalog of hand power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7½ x 10½ in.

Otis Elevator Co., 260 Eleventh Ave., New York, N. Y.
Electric Traction Elevators. An illustrated catalog describing gearless traction elevators. 28 pp. 8½ x 11 in.; and an illustrated catalog describing worm gear traction elevators. 24 pp. 6 x 9 in.
Self Leveling Elevators. A series of photographs showing gearless and worm gear self-leveling elevators. The adjustment with this type of elevator automatically levels the floor of the elevator with the floor level of the building.

Richards-Wilcox Mfg. Co., Aurora, Ill.
"Ideal" Elevator Door Equipment. Catalog showing elevator door hangers for one, two and three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.

Sedgwick Machine Works, 156 West 15th Street, New York

ESCALATORS

Otis Elevator Co., 260 Eleventh Ave., New York, N. Y.
Escalators. An illustrated catalog describing escalators, with layouts of typical installations. 36 pp. 6 x 9 in.

FACTORY EQUIPMENT

The Edwards Mfg. Co., Cincinnati, Ohio.
Edwards' Steel Equipment. Illustrated catalog. Showing steel lockers and shelving for factories, offices, stores, schools and hospitals, together with illustrations and description of "Edmanco" steel office furniture and filing cabinets. Size 8 x 11 in. 32 pp.

Manufacturing Equipment and Engineering Co., Farmingham, Mass.
Sanitary and Fireproof Equipment. Pamphlets illustrating metal lockers and furniture for factories, gymnasiums, hospitals, etc. 6 x 9 in.

FIREPLACES AND MANTELS

Stover Mfg. & Engine Co., 747 Lake Street, Freeport, Ill.
Strait & Richards, Inc., Newark, N. J.
Fireplace heaters, gas logs, fittings, etc.

FLOOR HARDENERS

General Chemical Company, The, 25 Broad Street, New York, N. Y.
Hard-N-Tyte for concrete and mortars. Booklet. 3½ x 8½ in. 8 pp. Illustrated. Describes use of Hard-N-Tyte as application for hardening concrete floors.

Sonnehorn Sons, Inc., L., 266 Pearl Street, New York.
Concrete and Lapidolith. Booklet. 5½ x 8½ in. 24 pp. Illustrated. Describing relation of Lapidolith chemical floor hardener to concrete construction.
Why Lapidolize? Booklet. 8½ x 11 in. 11 pp. Illustrated. Reasons why Lapidolith should be specified.
Lapidolith Specifications. Circular. 8½ x 10¼ in. 2 pp.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
Agatex and Its Performances. Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FLOORING

American Magnesia Products Co., 5730 Roosevelt Road, Chicago, Ill.
Velvetile Floorings: Its Uses and Application. Describes Belvetile Magnesia Flooring and tells how it is applied, with information as to its durability. 12 pp. 4 x 9 in.

Armstrong Cork & Insulation Co., 132 24th Street, Pittsburgh, Pa.
Linotile Floors. Catalog. 6 x 9 in. 40 pp. Color plates. Describes Linotile, a composition of ground cork, wood flour, linseed oil and various gums and pigments in tile form.
Armstrong's Cork Tile. Booklet. 5 x 7 in. 16 pp. Illustrated in color.

Armstrong Cork Co. (Linoleum Dept.), Lancaster, Pa.
Armstrong's Linoleum Floors. Catalog. 8½ x 11 in. 54 pp. Color plates. A technical treatise on linoleum, including tables and specifications for installing linoleum floors.
Speaking of Floors. Booklet. 11¼ x 15 in. 16 pp. Color plates.
Armstrong's Linoleum Pattern Book, 1921. Catalog. 3½ x 6 in. 176 pp. Color plates. Reproductions in color of all patterns of linoleum and cork carpet in the Armstrong line.
Quality Sample Book. Three books. 3½ x 5¼ in. Showing all grades and thicknesses in the Armstrong line of linoleum and cork carpets.

Carter Bloxonend Flooring Co., 1303 R. A. Long Bldg., Kansas City, Mo.
Blox-on-end Flooring. Catalog. 3¼ x 6¼ in. 20 pp. Illustrated. Describing Blox-on-end Flooring and its adaptability to concrete, wood or steel construction; also various methods of installation.
Specification Sheet. 8½ x 11 in. 4 pp. Illustrated. Standard specifications in convenient form for architects and engineers as recommended by the American Institute of Architects.

Congoleum Company, Inc., (Linoleum Dept.), Philadelphia, Pa.
"Specifications for Laying Linoleum and Cork Carpet, according to the Congoleum Company's new method compiled after years of careful research."
Linoleum Service Sheet. Gives complete printed specifications as well as detail drawings showing application in specific cases such as thresholds, staircases, under radiators, etc.
Installation and Care of Battleship Linoleum. Booklet. 6 x 9 in. 24 pp. Illustrated. Instructions as to the uses of Battleship Linoleum, its laying and care.
Pocket Pattern Book. Descriptive booklet. 3½ x 8½ in. 64 pp. Illustrated. Shows full color reproductions of every grade and color of Linoleum, Inlaid Linoleum, Cork Carpet and also all patterns of the Gold-Seal Line.

The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
The Perfect Floor. Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5½ x 7½ in.

The Marhleoid Co., 461 Eighth Avenue, New York, N. Y.
The Universal Flooring for Modern Buildings. Booklet. 6¼ x 6¼ in. 32 pp. Illustrated. Describes uses and contains specifications for Marbleoid flooring, base, wainscoting, etc.
Marbleoid Flooring for Hospitals. Bulletin. 8½ x 11 in. 4 pp. Illustrated. Describes the especial features of this composition floor for hospital buildings.
Marbleoid Specfications. Booklet. 8½ x 11 in. 44 pp. Illustrated.

Maple Flooring Mfgs. Assn., Chicago, Ill.
Booklet, How to Lay and Finish Maple, Beech and Birch Floors.

Muller Co., Franklyn R., Waukegan, Ill.
Asbestone Composition Flooring. Circulars. 8½ x 11 in. Description and Specifications.

Oak Flooring Manufacturers Association, 1014 Ashland Block, Chicago, Ill.
Modern Oak Floors. Booklet. 6½ x 9¼. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
Oak Flooring, How and When to Use It. Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.

Pacific Lumber Co., 2070 McCormick Bldg., Chicago, Ill.

United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.
Gypsum Poured, Steel Reinforced. Loose-leaf bulletins, 8½x11. Pyrofill.

Wood Mosaic Co., New Albany, Ind.

FLOOR SURFACING

Amer. Floor Surfacing Machine Co., 521 So. St. Clair Street, Toledo, Ohio.

Wayvell Chappell & Co., 137 No. Jackson Street, Waukegan, Ill.

M. L. Schleuter, 223 W. Illinois Street, Chicago, Ill.

Universal Floor Scraper Co., 110 Exchange Street, Worcester, Mass.

FLOOR VOIDS FOR USE IN CONCRETE

United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.
Loose-leaf bulletins, 8½ x 11. Pyrobar Gypsum Floor Tile.

FURNACES—See Heating Equipment

FURNITURE

Estey Organ Company, Brattleboro, Vt.
Pipe Organs. Complete specifications and full information furnished to the architect for pipe organs to be installed in any given residence, upon receipt of plans and other particulars.

Hampton Shops, 18 East 50th Street, New York, N. Y.
Glimpses from Hampton Exhibits. Brochure. 16 pp. 5 x 7½ in. Illustrated. Shows examples of Hampton work and gives one an idea of their resources. Of interest to the client as well as to the architect.

Albert Pick & Company, 208 West Randolph Street, Chicago, Ill.
Hotel, Apartment Hotel and Institution Installations. (Book BH120.) 16¼ x 11 in. Illustrated. 160 pp. Pictures and describes Hotel, Apartment Hotel, Club and Institution Installations with many photographs of representative establishments, showing equipment and furnishings in detail. Valuable to architects.
The "White" Door Bed and Space-Saving Devices. Booklet. 16¼ x 11 in. Illustrated. 34 pp. Consists almost exclusively of photographs, floor plans and diagrams, showing door beds, dressing cabinets, kitchen cabinets and other space-saving devices to increase rental values and augment living comfort.

GARAGE CONSTRUCTION

National Mfg. Co., Sterling, Ill.

GARBAGE DESTROYERS

Kerner Incinerator Company, 1027 Chestnut Street, Milwaukee, Wis.
The Sanitary Elimination of Household Waste. M-3 Folder. Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. 4 x 9 in.

E. C. Stearns & Co., 224 Oneida Street, Syracuse, N. Y.
Cut Out the Garbage Can. Pamphlet describing "The Incinerite," a garbage destroyer using natural, manufactured or gasoline gas. Made in wall type for new houses and portable type for buildings already erected. Contains table of details of all sizes with prices. 8 pp. Illustrated. 3 x 6 in.

GLASS

American Window Glass Co., Pittsburg, Pa.
Send for circular describing different varieties of window glass and how to select the proper kind.

American Three-Way Luxfer Prism Co., Cicero (Chicago), Ill.
Write for details and prices of glass prisms that will project daylight into dark interiors.

GYPSUM

Gypsum Industries Association, 111 West Washington Street, Chicago, Ill.
Digest of Fire Tests of Building Columns. This well arranged booklet contains the matter relating to columns protected by gypsum block, extracted from the Bureau of Standards' official report on "Fire Tests of Building Columns." For comparison data are given on unprotected columns; plaster on metal lath protection and hollow clay tile protection. 20 pp. Illustrated. 6 x 9 in.

U. S. Gypsum Company, 205 W. Monroe Street, Chicago, Ill.

OAK FLOORS

(For Everlasting Economy)



Red Cross National Headquarters, Washington, D. C.



Strand Hotel, Atlantic City, N. J.



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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 76*

HARDWARE

Caldwell Mfg. Co., 5 Jones Street, Rochester, N. Y.

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

Franz Manufacturing Company, Sterling, Ill.
Complete Hardware Catalog. A catalog of hardware for garages, stables, outside doors, windows, coal chutes, chimney caps, flues, coal holes, cisterns, etc. 128 pp. Illustrated. 7 x 10 in.

Griffin Mfg. Co., Erie, Pa.

Hardware Sales Co., 500 Fifth Avenue, New York

H. B. Ives Co., New Haven, Conn.

The Kawneer Co., Niles, Mich.
Kawneer, Simplex Window Fixtures. Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½ x 10¾ in. 16 pp.

Knape & Vogt Mfg. Co., Grand Rapids, Mich.
Garment Hangers—Send for illustrated booklet.

McKinney Mfg., Pittsburgh, Pa.
McKinney Cabinet Hardware. Catalog. 6 x 9 in. 32 pp. Illustrated. Describes complete line of hardware for cabinet and furniture work.
McKinney Hardware for Sliding Doors. Booklet. 6 x 9 in. 18 pp. Illustrated. Describes different types of sliding door hardware.

Monarch Metal Products Co., 5030-36 Penrose Street, St. Louis, Mo.
Monarch Control Locks. An illustrated pamphlet describing a control lock for outswinging casement windows. It does not mar the woodwork and does not interfere with screens nor disarrange the drapes. Holds windows firmly open at any angle. 4 pp. 8½ x 11 in.

F. E. Myers & Bro. Co., Ashland, Ohio.

National Mfg. Co., Sterling, Ill.

Richards-Wilcox Mfg. Co., Aurora, Ill.
Modern Hardware for Your Home. Catalog of hangers for vanishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Slidetite" garage door hardware. 24 pp. Illustrated. 8½ x 11 in.

Sargent & Company, New Haven, Conn.

The Stanley Works, New Britain, Conn.
Wrought Hardware. New 1921 Catalog. This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 376 pp. Illustrated. 6½ x 9½ in.
Garage Hardware. Booklet, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and band bolts, showing illustration and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.
Eight Garages and Their Stanley Hardware. Booklet. Plans, drawings and complete hardware specifications. Size 5 x 7 in. 32 pp.
The Stanley Works Ball Bearing Butts. Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in. 32 pp.

Vonnegut Hardware Co., Indianapolis, Ind.
Von Duprin Self-Releasing Fire Exit Devices. A catalog and educational work on panic-proof, burglar-proof self-releasing exit devices for doors and windows of buildings of any kind of occupancy. 41 pp. Illustrated. 8 x 11 in.
Prince Self-Releasing Fire Exit Devices. Supplement to Von Duprin Catalog No. 12. Contains valuable information for architects on the selection, detailing, etc., of Prince devices for doors and windows to insure safety against fire panic. 32 pp. Illustrated. 8 x 11 in.

Wagner Manufacturing Company, Cedar Falls, Iowa.
Catalog and Price List No. 14. This is a catalog on general house hardware specialties such as door hangers and track, sash holders, coal chutes, etc. Elevator door hardware is described in another book. 80 pp. Illustrated. 6 x 9 in.

George Lester Wilkins, 1775 Luot Avenue, Chicago, Ill.
Wilkins Casement Adjusters. Leaflets, illustrated. Jamb and sill section details of windows, equipped with the casement adjuster and specifications for installation. Size 8½ x 11 in. 4 pp.

HEATING EQUIPMENT

Alberger Heater Company, Buffalo, N. Y.
Heating and Cooling Equipment. Catalog No. 3. A useful manual for architects in addition to serving as a catalogue of heating and cooling equipment. Explains fully the advantages of spirally corrugated heater tubing. 48 pp. Illustrated with line cuts and half tones. 7¾ x 10¾ in.

American District Steam Company, North Tonawanda, N. Y.
Bulletin No. 150-AF. 6 x 9 in. 32 pp. Illustrated. Describes the Adsco System of Atmospheric Steam Heating and explains how it saves 20 to 30% of fuel cost. Tells how to figure radiation.
Catalog No. 21-AF. 6 x 9 in. 200 pp. Illustrated. Lists and describes the full line of equipment and devices manufactured for use on underground and interior steam mains, expansion joints, steam meters, condensation meters, traps, flange fittings, angle fittings, manhole curbs, alignment guides etc.

American Radiator Co., 816 South Michigan Avenue, Chicago, Ill.
Engineers' Data Book. 8 x 10¾ in. 48 pp. Illustrated. Valuable engineering data for estimating heating and ventilating requirements.
Ventilation for Vento Heaters. Catalog. 8 x 10¾ in. 24 pp. Illustrated. Examples of installation.

James B. Clow & Sons, 534 South Franklin Street, Chicago, Ill.
Gasteam. Catalog. 6 x 9 in. 16 pp. Illustrated. New radiator using gas for fuel.

Co-operative Foundry Co., Rochester, N. Y.
Manufacturers of pipeless furnace.

Crane Company, 836 South Michigan Avenue, Chicago, Ill.
Steam. Catalogue. A book containing full descriptions of the complete line of Crane valves, fittings, etc. 800 pp. Illustrated. 6 x 9 in.

C. A. Dunham Co., 230 East Ohio Street, Chicago, Ill.
Dunham Heating Service. Technical Bulletins describing Dunham products for home heating, return and vacuum systems. Size 8½ x 11 in.
The Dunham Hand Book. Booklet No. 114, containing heating data for the practical man. Pocket size. 144 pp.

Excelso Specialty Works, 119 Clinton Street, Buffalo, N. Y.
Excelso Water Heater. Booklet. 12 pp. 3 x 6 in. Illustrated. Describing the new Excelso method of generating domestic hot water in connection with heating boilers. (Firepot Coil eleminated.)

The Farquhar Furnace Company, Wilmington, Ohio.
Healthful Helpful Hints. A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Illustrated. 4¾ x 9¼ in.
A Plain Presentation to Dealers. A book of selling talk for dealers in Farquhar Furnaces. Four model heating layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Illustrated. 8½ x 11 in.

Gorton & Lidgerwood Co., 96 Liberty Street, New York, N. Y.
Gorton Self-Feeding Boilers. Booklet. 4¼ x 7¼ in. 32 pp. Illustrated. Descriptions, specifications and prices.

Hardin-Lavin Co., 4538 Cottage Grove Ave., Chicago, Ill.

Hart & Crouse Company, Utica, N. Y.
Catalogue 2721 of Hart & Crouse Smokeless Water Tube Boilers. This is a valuable description of cast iron boilers embodying the true down draft principle of smokeless combustion. Contains data for designers and illustrates buildings in which these boilers are installed. 48 pp. Illustrated. 8 x 11 in.

Hess Warming & Ventilating Co., 1205D Tacoma Building, Chicago, Ill.
Modern Furnace Heating. Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.

Jenkins Bros., 80 White Street, New York, N. Y.
Catalog No. 21. This catalog contains descriptions of all the valves, packing, etc., manufactured by Jenkins Bros. Includes also dimensions and price lists of valves and parts. 271 pp. Illustrated. 4 x 6¼ in. Stiff paper cover.
The Valve Behind a Good Heating System. This booklet describes Jenkins Radiator Valves, Automatic Air Valves and other valves used in connection with steam and hot water heating. 16 pp. Illustrated. 4½ x 7¼ in. Stiff paper cover.

Kelsey Heating Company, James Street, Syracuse, N. Y.
Booklet No. 5. 4 x 9. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.
Monroe Pipeless Booklet. 4½ x 8 in. 20 pp. Illustrated.
Monroe Tubular Heater. Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
Syracuse Pipeless Booklet. 4½ x 8 in. 12 pp. Illustrated. General Booklet giving sizes and capacities.

Kewanee Boiler Co., Kewanee, Ill.
Kewanee on the Job. Catalog. 8½ x 11 in. 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators, etc.
Catalog No. 73. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel power boilers with complete specifications.
Catalog No. 74. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel heating boilers with specifications.
Catalog No. 75. 8½ x 11. 6 pp. Illustrated. Specifications on Tabasco Water Heaters, Kewanee water heating garbage burners and Kewanee stel tanks.

Monash-Younker Co., 121 West 42nd Street, New York, N. Y.
Valves, Syphons and Traps. A series of pamphlets to enclose in envelopes, describing the well known Thermostatic Return Line Valves and other heating equipment specialties made by this company.

Minneapolis Heat Regulator Company, Minneapolis, Minn.
The Heart of the Heating Plant. Catalog. 6 x 9 in. 20 pp. Illustrated. Describing the Minneapolis Heat Regulator, its construction, application and operation for the automatic control of temperature where coal, gas, fuel oil or street steam is used.

Page Boiler Company, The Wm. H., 141 West 36th Street, New York, N. Y.
Page Boilers. Catalog. 4½ x 8 in. 84 pp. Illustrated. Descriptions with specifications of the Volunteer Round and Monarch Square Sectional Boilers; also the Monarch Down-Draft Smokeless Boiler; with method for apportioning size of boiler and radiation, and other heating data.

Richardson & Boynton Co., New York, N. Y.; Chicago, Ill.; Philadelphia, Pa.; Providence, R. I.; Boston, Mass.
The Richardson Vapor-Vacuum-Pressure Heating System. An interesting book which presents in clear non-technical language the principles of Vapor-Vacuum-Pressure heating; the economy over ordinary steam heating; steam and hot-water system may be altered to use this principle with views of buildings where the V-V-P system is installed. 14 pp. Illustrated. 8 x 11 in.
Perfect Warm Air Furnaces. No. 203. Contains a full description of various types of warm air furnaces and parts, with dimensions and necessary data. 24 pp. Illustrated. 8 x 10½ in.

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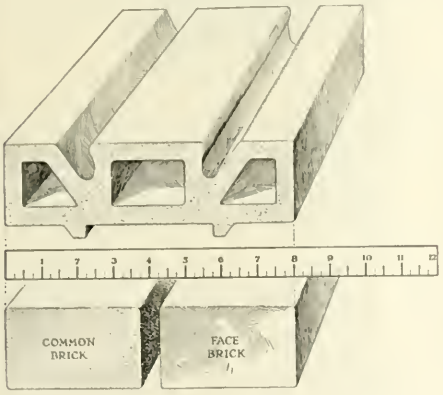
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NEW YORK WATSONTOWN, PA.

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REG. U. S. PAT. OFF.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 78*

Perfect Cooking Ranges. Description and dimensions of the complete line of the new high enamel finish Richardson Perfect ranges, with charts and information regarding combination coal and gas cooking ranges. 40 pp Illustrated. 8½ x 11 in.

Smith Co., H. B., 57 Main Street, Westfield, Mass.
General Boiler and Radiator Catalog. 4 x 7 in. 90 pp. Illustrated Giving ratings, dimensions, capacities and working pressures.
Engneer's Data Ring Book 4 x 7 in. 125 pp. Illustrated.
Architect's and Contractor's Binders. These binders are made up of 9½ x 11 in. folders of different kinds giving dimensions, price lists, and erecting directions on the different lines of our manufacture.

The Steam Corporation, 215 No. Michigan Avenue, Chicago, Ill.

B. F. Sturtevant Company, Inc., Hyde Park, Boston, Mass.
Catalog No. 230. 8¼ x 10¾ in. 132 pp. Illustrated. Gives description and data tables of various types of heaters, also of steam traps.
Bulletin No. 227. 8⅜ x 10 11/16 in. 28 pp. Blue prints of heating and ventilating layouts in public buildings, factories, etc.
Catalog No. 1015. Book on Heating and Ventilating, complete with installations and diagrams.

United States Radiator Corporation, Detroit, Mich.
The Complete Line. Catalog. 4¼ x 7¼ in. 225 pp. Illustrated. Contains important technical information of special interest to architects and heating engineers.
Capitol Smokeless Type Boilers. Booklet. 8½ x 11 in. 12 pp. Illustrated. Describing a new type of low-pressure heating boiler which burns soft coal without smoke.

Warren Webster & Co., Camden, N. J.
Webster Vacuum System of Steam Heating. Catalog. 8 x 10½ in. 36 pp. Illustrated. Describing the Webster Vacuum System of Steam Heating, its principles of operation, and advantages of installation.
Webster Feed-Water Heaters. Catalog. 8 x 10½ in. 28 pp. Illustrated. Describing the construction and operation of the Webster Feed-Water Heaters for steam-heating systems, power plants and industrial plants of every type.

HEAT REGULATORS

Minneapolis Heat Regulator Co., Minneapolis, Minn.
The Heart of the Heating Plant. An illustrated catalog, describing the Minneapolis Heat Regulator, its construction, application and operation for the automatic control of temperature where coal, gas, fuel oil or street steam is used. Complete catalog and list prices. Size 6 x 9 in. 20 pp.

HOISTS—See Elevators

American Saw Mill Machinery Co., Hackettstown, N. J.
Bulletin No. 10 describing several styles of builders' hoists.

C., H., and E. Mfg. Co., Milwaukee, Wis.
Bulletin No. 3. Hoists and Mortar Mixers.

Yale & Towne Mfg. Co., New Haven, Conn.

HOLLOW TILE

Fiske & Company, Boston, Mass.

National Fire Proofing Co., Pittsburgh, Pa.

INCINERATORS—See Garbage Destroyers

INSULATION

Bird & Son., Inc., East Walpole, Mass.
Neponset Black Building Paper, samples sent on application.

Bishopric Mfg. Company., 103 Este Avenue, Cincinnati, Ohio.
Homes built on the Wisdom of Ages. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.

Brown Co., Portland, Me.
Send for samples of "Bermico" Sheathing paper—different weights for all purposes of insulation

Samuel Cabot, Inc., 141 Milk St., Boston, Mass.
Cabot's Quilt. Catalog containing drawings and description

Philip Carey Co., The, Cincinnati, Ohio.
Carey Asbestos and MaMgnesia Products. Catalog. 6 x 9 in. 72 pp. Illustrated.

The Hydrex Asphalt Products Corp., 170 Broadway, New York, N. Y.
Sound Deadening Insulation. Illustrated and descriptive booklet. Specifications and suggestions for use of Hydrex "Saniflor" Sound Deadening Felt. Size 8½ x 11 in. 12 pp.

Johns-Manville, Inc., Madison Avenue and 41st Street, New York, N. Y.
Business Noise, Its Cost and Prevention. Booklet. 6 x 9¼ in. 16 pp. Illustrated Data on correction of acoustics in offices, theatres, churches, etc.

United States Mineral Wool Co., 280 Madison Avenue, New York, N. Y.
The Uses of Mineral Wool in Architecture. Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use It gives rule for estimate and cost. Size 5¼ x 6½ in. 24 pp.

IRON AND STEEL—See also Metals

The American Rolling Mill Co., Middleton, Ohio
Armco in Picture and Fact. A booklet describing the manufacture of pure iron in sheets and giving useful tables of sheet sizes and weights. 247 pp Illustrated. 9 x 6 in
Why Steel and Iron Rust. A booklet full of interesting data. 16 pp Illustrated. 1¼ x 6½ in.

JOISTS AND STUDS, PRESSED STEEL

Truscon Steel Company, Youngstown, Ohio.
Truscon Structural Pressed Steel. Catalog 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

Berger Mfg. Co., Canton, Ohio.

General Fireproofing Co., Youngstown, Ohio.

Natinnal Pressed Steel Co., Massillon, Ohio.
Handbook of National Steel Lumber. 183 pages, illustrated. Cloth bound. Describes the use of Metal Lumber in building construction.

KITCHENS AND EQUIPMENT

La Grange Fixture Corp., La Grange, Ind.

LATH, METAL AND REINFORCING

American Steel & Wire Co., Chicago, Ill.
Stucco Houses Reinforced With Triangle Mesh Fabric. A pamphlet containing valuable data on stucco work with tables of quantities of materials and many illustrations of houses covered with stucco applied on Triangle Mesh Fabric. 24 pp. Illustrated. 6 x 9 in.

The Bostwick Steel Lath Co., Niles, Ohio.
Bostwick Steel Lath, Revised Edition, 1920. Catalog. 9 x 11½ in. 28 pp. Illustrated. Covers the entire line. Drawings and Specifications.

Buffalo Wire Works Co., Inc., 446 Terrace, Buffalo, N. Y.
Write for Booklet 61-F on wire lathing.

Concrete Engineering Co., Omaha, Neb.
How to Use Ceco Lathing Materials. An illustrated treatise on the use of expanded metal lath. Contains construction details and complete specifications, with sample piece of lath in pocket on cover of book. 16 pp. Illustrated. 8½ x 11 in.

Corrugated Bar Company, Inc., Buffalo, N. Y.
Corr-Mesh. Catalog. 6 x 9 in. Illustrated. Describes the characteristics of Corr-Mesh, a ribbed expanded metal used in concrete and stucco construction.
Corr-Plate. Catalog. 6 x 9 in. 93 pp. Illustrated. Describes a type of girderless floor construction in which the reinforcing bars are laid in two directions only.

General Fireproofing Co., Youngstown, Ohio.

North Western Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Designing Data. Catalog. 6 x 9 in. 94 pp. Illustrated. Describes most efficient use of Econo Expanded Metal Reinforcing.
Formless Concrete Construction. Catalog. 6 x 9 in. 80 pp. Illustrated. Describes use of T-Rib Chanelath, a form and reinforcing for concrete.

Truscon Steel Co., Youngstown, Ohio.
Hy-Rib and Metal Lath. 18th Edition. Catalog. 8¼ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

LAUNDRY EQUIPMENT

Canton Clothes Dryer Co., Canton, Ohio.

LEVELS

A. S. Aloe Co., 622 Olive Street, St. Louis, Mo.

Keuffel & Esser Co., Hoboken, N. J.

Kalesch & Co., 138 Fulton Street, New York.

Warren-Knight Company, 136 North 12th St., Philadelphia, Pa
"Sterling" Levels and Transits. 32 pp. illustrated catalog. Description, specifications and structural advantages required in modern practice for establishing lines, levels, angles, etc. Vest Pocket Manual of adjustments.

David White Co., 907 Chestnut Street, Milwaukee, Wis.

Wissler Instroment Co., 609 No. Broadway, St Louis, Mo.

LIGHTING

I. P. Frink, Inc., 24th Street and 10th Avenue, New York, N. Y.
Modern Church and Cathedral Illumination. An illustrated booklet on lighting systems for various conditions of indirect, direct-indirect lighting reflecting electroliers and lighting from concealed sources. Photographs of interiors, typical sections of cove lighting and data sheet for chancel lighting and list prices are given. Size 7 x 10 in. 56 pp.
Lighting Service for Hospitals. A booklet illustrated with photographs and drawings, showing the types of lights for use in hospitals, as operating table reflectors, linolite and multilite concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses. Size 7 x 10 in. 12 pp.
Picture Lighting. Booklet 422. A pamphlet describing Frink Reflectors for lighting pictures, art galleries, decorated ceilings, cove lighting, the lighting of stained glass, etc., and containing a list of private and public galleries using Frink Reflectors. 24 pp. Illustrated. 5¼ x 7 in.
Frink Reflectors and Lighting Specialties for Stores. Catalog No. 424. A catalog containing a description of the Frink Lighting System for Stores; the Synthetic System of Window Illumination; and a number of appliances to produce the most effective lighting of displayed objects. 20 pp. Illustrated. 8 x 11 in.
Frink Lighting Service for Banks and Insurance Companies. Reflectors. Catalog No. 425. A very interesting treatise on the lighting of offices; with details of illustrations and description of lamps and reflectors. Contains a list covering several pages, of banks using Frink Desk and Screen Fixtures. 30 pp. Illustrated. 8¼ x 11 in.

Harvey Hubbell, Inc., Bridgeport, Conn.
Hubbell Flush Door Receptacles. Description of a safe, convenient and practical wall outlet de luxe for fine residences, clubs, hotels, public buildings and offices. 4 pp. Illustrated. 8 x 10 in.

Luminous Unit Co., St. Louis, Mo.
"Brascolite Bulletin" No. 1. Architectural Series on Hospitals, showing illustrations of various hospitals equipped with Brascolites, Aglites, and other Luminous Unit Co. products. 28 pp. Illustrated. 8 x 10½ in.



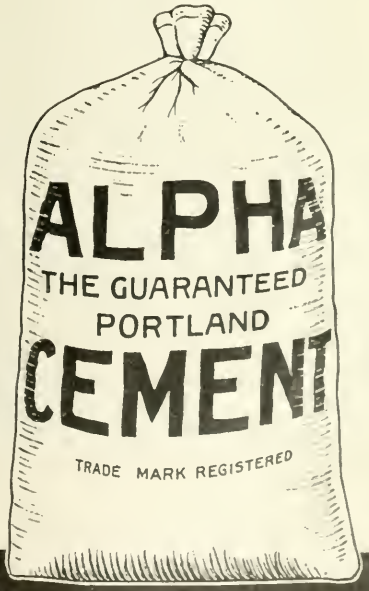
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Small Warehouses
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Septic Tank
Oil Storage Tank
Tennis Court
Inclosure Walls
Barn and Silo
Cement Blocks
Corn Crib
Poultry House
Storage House
Smoke House
Hog House
Dipping Vat
Tanks and Troughs
Piers for Small Boats
Garden Furniture
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Coal Pocket
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SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 80*

Regular "Brascolite" Catalog No. 8. This catalog contains descriptions with illustrations of Brascolites, Aglites, Elites, Industrolites, and Lumovitro for all classes of buildings. 28 pp. Illustrated. 8 x 10½ in.

Mitchell Vance Co., Inc., 503-511 West 24th Street, New York, N. Y.

Catalog No. 25. A descriptive catalog, with prices, of the "T R. B." Lighting Unit, for perfect distribution of light without glare and without shadows. 24 pp. Illustrated. 8 x 10 in.

National X-Ray Reflector Co., Chicago, Ill.

Lighting from Concealed Sources. A treatise, bound in buckram. The history, explanation of the laws of light reflection, giving types of lamps, reflectors, showing charts, tables, sections, photographs and lighting plans for dwellings, public buildings in which it has been used. Size 8½ x 11 in. 32 pp. 246 pp.

The Reflectolyte Co., 914 I Pine Street, St. Louis, Mo.

"Reflectolyte" Catalog No. 4. Description, Engineering Data, descriptions and prices of the well known type of reflector and suspended bowl lighting fixtures. 32 pp. Illustrated. 7¼ x 10¾ in.

Rush Porcelain Co., 1924 Archer Avenue, Chicago, Ill.

Catalog No. 7 of July, 1921. Twenty-three pages, illustrating white solid porcelain and china lighting fixtures for bath rooms, utility rooms, kitchens and wherever a white, sanitary effect is desired.

LIGHTNING RODS

Boston Lightning Rod Co., 755 Boylston Street, Boston, Mass.
E. G. Washburne Co., 307 Fulton Street, New York.

LINOLEUM—See also Flooring

Armstrong Cork Co., Linoleum Department, Lancaster, Pa.

Armstrong's Linoleum Floors. A handbook for architects, published in the file form of (8½ x 11 in.), recommended by the American Institute of Architects. A technical treatise on Linoleum, containing general information, tables of grades, gauges and weights, specimen specifications, and detailed directions for laying linoleum. Profusely illustrated in colors.

Joseph Wild Company, 230 Fifth Avenue, New York.

LUMBER

Arkansas Soft Pine Bureau, 802 Boyle Building, Little Rock, Ark.

Arkansas Soft Pine Handbook. Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Molding Designs.

The Home You Long For. Booklet. 8¼ x 11 in. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.

California Redwood Association, 206 Marvin Building, San Francisco, Cal.

California Redwood Homes. Booklet. 6 x 9 in. 16 pp. Illustrated. Describes the use of Redwood Lumber for various places and conditions in the building of the home.

Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.

The Post Everlasting. Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.

Poles That Resist Decay. Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.

Morgan Millwork Organization, Chicago, Ill.

Building with Assurance. Book. 8½ x 11 in. 408 pp. Illustrated. Valuable to architects for the Standardized Mill Work illustrated and described.

Price Supplement. Catalog. 4 x 8 in. 96 pp. Illustrated. Prices all illustrations in "Building With Assurance" and is valuable in connection with it or by itself.

Pacific Lumber Company of Illinois, The, 1105 Lumber Exchange Building, Chicago, Ill.

Engineering Digest. Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipes, Outbuildings. Irrigation Flumes, Drainage Boxes, Greenhouses, etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.

Southern Cypress Mfrs. Assn., New Orleans, La.

Many interesting booklets on the use of Cypress for all purposes.

LUMBER, ASBESTOS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

Ambler Asbestos Building Lumber. Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½ x 11 in. 32 pp.

MARBLE, ARTIFICIAL

Art Stone Co., Waynesboro, Pa

METAL FORMS

Blaw-Knox Company, Pittsburgh, Pa.

Collapsible steel forms for concrete construction. Interesting descriptive catalog.

METAL LATH—See Lath, Metal and Reinforcing

METALS

American Brass Company, Waterbury, Conn.

Illustrated pamphlet describes the use and adaptability of extruded architectural shapes to meet the architect's design.

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.

Reference Book. Pocket Edition. 2¾ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.

Copper—Its Effect Upon Steel for Roofing Tin. Catalog 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.

Apollo and Apollo-Keystone Galvanized Sheets. Catalog. 8½ x 11 in. 20 pp. Illustrated.

Research in the Corrosion Resistance of Copper Steel. Booklet. 8½x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.

Facts Simply and Briefly Told. Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.

Black Sheets and Special Sheets. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc.

Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

The Cincinnati Mfg. Co., Cincinnati, Ohio.

Ornamental Iron and Bronze. A catalog of metal work for banks, mausoleum bronze and tablets, hollow metal and kalamein doors, elevator cars and enclosures, builders' iron and wire work. 164 pp. Illustrated. 7½ x 10¾ in.

The New Jersey Zinc Company, 160 Front Street, New York, N. Y.

Building for Permanence. A booklet relating to the value of zinc leaders, gutters, flashings, valleys and ridge roll. 8 pp. Illustrated. 5¼ x 7 in.

Rome Brass & Copper Company, Rome, N. Y.

Descriptive Price List. 5 x 7 in. A leather-covered loose-leaf book listing sheets, tubes, rods, rolls, anodes, strips, extruded shapes, angles and channels, tapered tubes and hose pipes; molding, door-rail; commutator bars and segments; electrical copper bar, rivets and burs.

N. & G. Taylor Co., Philadelphia, Pa.

Booklet and Detail Sheet of Tin Roofing. See Roofing.

The Youngstown Sheet and Tube Company, Youngstown, Ohio.

Youngstown Copperoid Steel Sheets. A description of tests successfully passed by copper-bearing steel sheets made by The Youngstown Sheet and Tube Company. 6 pp. 3½ x 6¼ in.

METAL TRIM—See Doors, Windows and Trim, Metal

MILLWORK—See also Lumber—Building Construction—Doors and Windows

MORTAR—See also Cement

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.

Clinton Mortar Colors. Booklet. 3½ x 6¾ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

Ricketson Mineral Paint Works, Milwaukee, Wis.

Ricketson Mortar Colors. Two interesting folders with color card of these well known fadeless mortar colors in use for thirty-five years. 3¼ x 6 in.

MOULDINGS, METAL

National Metal Molding Co., 25 Fulton Building, Pittsburgh, Pa.

Bulletins. Bound in a standard correspondence folder, suitably indexed for convenient filing, describes complete line of metal moldings.

Handbook for the Man on the Job. An illustrated book of fittings and methods, with description and instructions for installing National Metal Molding under all conditions; a book meant to be conveniently carried and used on the job. Size 4¾ x 6 in. 102 pp.

OFFICE SUPPLIES

Dixon Crucible Co., Joseph, Pencil Dept., 224 J. Jersey City, N. J.

Finding Your Pencil. Booklet. 6¼ x 3¼. 16 pp. Illustrated.

The First Five. Booklet. 3½x 5¼ in. 10 pp. Illustrated.

A Study in Sepia. Booklet. 7 x 4½ in. 5 pp. Illustrated.

ORNAMENTS, GARDEN

Howard Studios, Inc., 5 and 7 West 47th Street, New York, N. Y.

Garden Ornaments. Illustrated catalog. Garden ornaments and mantels. Size 8 x 11 in. 40 pp. Price fifty cents.

ORNAMENTAL METAL WORK—See also Architectural Iron Work—Metals

Newman Manufacturing Company, 717 Sycamore Street, Cincinnati, Ohio.

Newman Ornamental Metal Work—Catalog G. Booklet showing installations of brass and bronze railings, door hardware, grille work, etc., in banks, theatres and other public buildings. Also shows lighting fixtures and special metal work of all descriptions. 64 pp. Illustrated. 8 x 11 in.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Berry Brothers, Detroit, Michigan.

"Natural Woods and How to Finish Them." Booklet. 6½ x4¾ in. 95 pp. Containing technical information and advice concerning wood finishing.

"Beautiful Homes." Booklet. 8½ x 6½ in. 26 pp. Illustrated in colors. Giving information to home builders and others on interior finishing.

Bird & Company, J. A. & W., 88 Pearl Street, Boston, Mass.

Ripolin Specifications. Booklet. 8 x 10½ in. 12 pp. Description. Contains twenty-one carefully prepared specifications for undercoats for different types of work.

BUILDING AGE

AND

THE BUILDERS' JOURNAL

New York, MARCH, 1922



Better Homes at Less Cost

Novel Methods of Design and Construction Devised by Ernest Flagg for the Economical Erection of Artistic Small Houses

TOWERING six hundred forty feet above Broadway, New York, rises the famous Singer Building. The master mind which designed this gigantic building is also the designer of the two small houses, shown on this page. The designing of big buildings is the everyday work of Mr. Ernest Flagg, noted New York architect, still he finds it just as interesting to plan the small house as he feels it constitutes, perhaps, the most important part of new construction at the present time.

Great minds when they work on simple everyday problems, blaze the way for innovations. It is not surprising, therefore, that Mr. Flagg would devise novel methods for erecting small homes—but that he would bother with so small a subject.

It is indeed fortunate for the building industry that there are men like Mr. Flagg who will do pioneer work from altruistic motives only, making innumerable trials at considerable personal financial expense to find out better ways of constructing small buildings and then giving the results of this creative work to the industry at large for its betterment.

The Editor of BUILDING AGE and THE BUILDERS' JOURNAL was informed by a mutual friend of Mr. Flagg's remarkable work, and feeling that this would be something of interest to our readers, he took the matter up with Mr. Flagg, which led to his kind invitation to the editor to visit some of the buildings under construction These buildings are located at Dongan Hills, Staten Island, New York, and in them Mr. Flagg has actually built and put to use the various labor and cost saving systems that he has devised.



Two Small Houses Designed and Sketched by Mr. Ernest Flagg

Used to the ordinary methods of construction the writer could not but marvel at the amount of thought that Mr. Flagg has given to the small house both in design and construction.

To one of the writer's questions Mr. Flagg replied. "I have set out to change the conventional type of small house and it is the largest contract I ever undertook."

The cry today is for more homes, but the expense for material and la-

bor is still beyond the reach of many. Realizing these handicaps, Mr. Flagg set to work to devise some practical methods of construction and design that would reduce cost. The method which he has used makes available space usually wasted or which is of little value. About 30 per cent. of the cubic contents of the ordinary small house is of that character and is mostly in the cellar and slopes of the roofs. The amount of material is thereby cut down, and the method of construction used is such that a large portion of the work can be done by ordinary labor.

In the locality where Mr. Flagg started his experimental houses, an excellent variety of stone was to be had. This was a sort of soap stone which is impervious to moisture, therefore, the inside walls are plastered directly on the stone and have been found moisture proof. The advantage of selecting a stone of this sort is at once apparent and the saving considerable.

For locations where these favorable conditions do not exist, or stone cannot be had, the thought occurred to the editor that the same details of building Mr. Flagg has devised could be applied to brick, hollow tile, or concrete construction just as well, so as to reap the benefit of the large saving in cost.

In many of the designs recommended by Mr. Flagg, cellars and attics have been omitted. In the sketch at top of page 19 the low building towards the right is a storage shed that serves the same function as a cellar, with the advantage of being above ground.

"To keep operating cost down," Mr. Flagg said, "impress upon your readers that the item of upkeep should be carefully considered in construction, using materials and devices that will not require constant painting and repairs for their preservation and omitting those which do."



The Mosaic Stone Wall Forms Removed—Lower Part Has Been Pointed

Mr. Flagg then pointed out how outside wood trim was eliminated as much as possible, porch floors are of concrete or brick, outside steps of masonry, etc. Windows are all inward opening casements; copper screening is fastened with copper tacks on the window frame and these are left in place all year—no expense for screen frames and no work taking down and putting up or painting them.

The first floors in the houses are of waterproofed concrete with a wood floor laid on top of this on sleepers. Beam ceilings are used in most rooms, these are real beams that actually hold up the upper floors, and result in saving most of the cost of plaster ceilings and of space wasted in floor thickness.

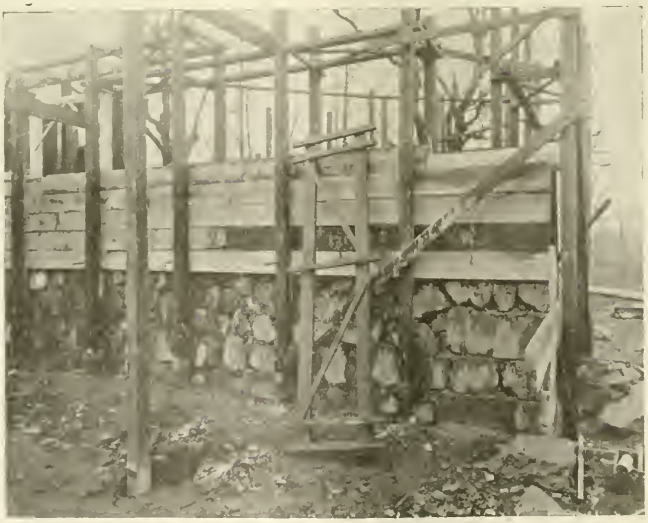
Until quite recently, wood in this country has been abundant and cheap. It was natural, therefore, that great use should have been made of it. Stone for ordinary houses, except in certain limited areas, has been little used, chiefly because of its supposed great cost. Now wood is daily becoming more expensive and scarce, and the conditions are, therefore, ripe for a change from wood to stone or other incombustible material, but it will doubtless come about slowly.

Both speed and economy in building depend on forethought and system, which, if properly followed, should greatly reduce the cost of building.

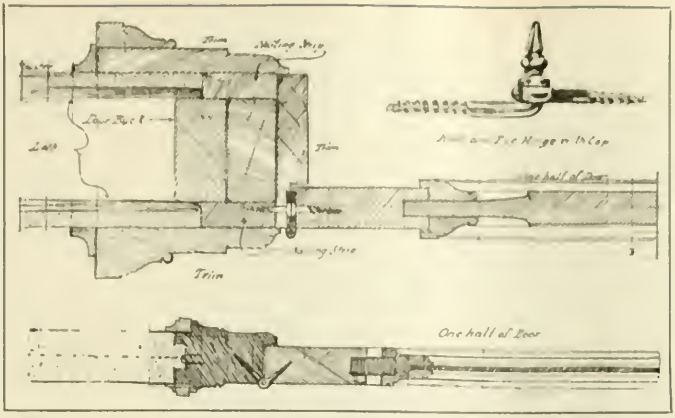
Mr. Flagg kindly explained that the theory for the use of stone in these houses is that low walls are much less expensive to build than high ones; it is possible to use forms without the usual waste of lumber which reduces the cost of the stonework.

The theory for the use of wood is: It is more economical to use a better grade of wood and expose the construction, correcting shrinkages, if they occur, than to use poorer stuff for structural members and then go to the expense of covering them up and casing them in. Indeed, under this latter plan, which is the common one, more material is often required for casing than for the structural members themselves.

If the forms are well made and the work of setting them properly



The Forms Used for Laying Up Masonry Walls—All Parts Are to Be Used as Permanent Construction Equipment—They Also Serve as Scaffolding



Plan of One-Half of an Ordinary Door and Its Jamb in Contrast with the Corresponding Parts of the Doorway Devised by Mr. Flagg—Both Plans Are to the Same Scale



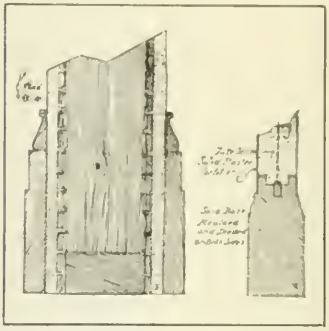
Plasterers Working Together Against Each Other on Both Sides of Jute Net Support for Plaster Partition

done, this method secures remarkable accuracy, and all parts fit with precision. If all necessary materials are on hand, as they should be before beginning, the work proceeds with a degree of exactness and speed uncommon in ordinary building. As all parts and methods are uniform in each instance, the workmen soon become used to them.

In the construction of stone walls for his experimental houses Mr. Flagg has hit upon a very simple method of obtaining good work from unskilled labor by offering a bonus of $50 for a perfect job, to be divided among the men. For every stone that is unevenly placed, which makes it look badly, $5 is deducted from the $50. Needless to say the method works like a charm, the men take an interest in doing good work as it pays them.

Perhaps the most remarkable feature introduced by Mr. Flagg is the solid plaster partition which is made by simply hanging loosely woven burlap or jute net, tacking it in place and plastering on it, working both sides at once and making a solid plaster partition about 1-3/4 inches thick! This looked rather weak to the writer and he expressed just a little doubt about it. Mr. Flagg smilingly suggested to test it, which was done rather vigorously, and the writer was then convinced of its desirability for all non-bearing partitions. This method not only saves the cost of studs, sills, plates and lath, but also the labor of their erection, and permits of several other economies, an important one being the elimination of most of the ordinary trim or casing.

The usual way of making a doorway is to construct a frame around the opening, called a door-buck, and after the plastering is finished cover the buck with a casing. The true frame is thus covered up, and the archi-



Section Through an Ordinary Lath and Plastered Partition Contrasted with a Corresponding Section of the Solid Plaster Partition and Base—Both Sections Are the Same Size



Four Different Stages in the Construction of the Plaster Partition on Jute Net Support

trave which one sees about the door way is a sham.

These partitions cost considerably less than ordinary ones, but this is by no means the real measure of their economy. Floor area in almost any kind of house costs at least $0.00 per square foot. Six-inch partitions occupy one-half square foot of area for each running foot, that is to say, space which costs an owner at least $3.00 to obtain. These thin partitions occupy one-third as much, and the saving is proportional.

The hanging of a door under ordinary circumstances is quite an operation, and consumes a great deal of time, for each opening, being cased in with its sham architrave, is bound to differ somewhat from the others, and each door must be separately adjusted. If made as here described no such adjustment is necessary. The frames are put together in the shop of a size to correspond with the doors and all hardware applied. If frames are set plumb nothing remains to be done to them at the building but to place the doors on their hinges. By this means a vast amount of useless material and labor is saved, a great deal of time gained, and better results secured.

With the thin partitions and narrow door-jambs it is very convenient to use doors which have a rabbet instead of on the jamb.

When rabbeted doors are used the door-frames need be no thicker than the plaster partitions, i. e., 1-3/4", as shown in the illustrations, but if the rabbet is on the jamb, it is more convenient to use slightly thicker stuff, as shown in the other figure. When that is done, eyelet hinges may be used or hook-and-eye hinges, as illustrated, but such hinges are no good unless properly set.

It is not only in doorways and bases that useless materials are dispensed with, as the same methods apply to windows and all other places where building window-boxes after the usual fashion, the frame itself is casing is commonly used. Instead of moulded to adjust it to the sash, and all casing about it, whether inside or outside, dispensed with.

By this means most of the ordinary woodwork trimming of the house is omitted and the cost of all that material saved, also the cost of its installation, painting, and upkeep; besides which a great amount of inflammable matter is excluded from the building, lessening the fire risk.



This Roof Is Just Plain Rubberoid Roofing, Laid in Horizontal Strips—The Shingle Effect Is Simply Obtained by Use of Metal Clips

Some of the details of construction that Mr. Flagg has devised are described in an interesting book, particulars of which can be obtained from A. W. Hendrickson, 111 East 40th Street, New York.

One point that Mr. Flagg impressed upon the writer was that it is not "what a thing costs but what you get for your money," and he has made some practical applications of this axiom. The roofs of his buildings are covered with the cheapest grade of prepared roofing. Still, they have an artistic appearance. The common method has been to use this roll roofing in long strips, cementing the edges and making the finish at eaves by bending it over and tacking in place with some beautiful (?) tin washers, the whole effect being cheap.

Mr. Flagg has taken this same material, cut it into strips nine inches wide, laid these horizontally with a lap of two inches, and the edges at eaves are covered with thin sheet lead which makes a neat finish, as it is firmly held in place by a few copper nails. This makes an absolutely permanent and substantial finish. The strips of roofing are not cemented down as is ordinarily done, but little clips are used and spaced about six inches apart. Before these are bent over they form a guide on which to hold the next strip, therefore, the strips of roofing can be laid very quickly. As soon as a strip is in position the clips are turned down; this holding the roofing in position.

After a time the natural material in this composition roofing will cement itself together. The clips used are made of galvanized iron, which in time rust out and rain washing down on the roof produces a streaked effect not unlike shingles. This is very clearly illustrated in the picture shown herewith, but when seen on a roof it has the appearance of a slate roof. Here is a new idea of obtaining good effects by using just common every-day materials.

While the Editor was very enthusiastic at seeing these new methods, Mr. Flagg cautioned that his system of building is intended for repetition and stated "It would hardly pay to adopt it in its entirety for a single house if the matter were to end there. Where the processes and apparatus are used, over and over again, great economy should result; but for a single building, the trouble and expense of introducing so many new or unusual features and methods might offset the benefits which should accrue under more favorable conditions.

"Standardization both of the parts and workmanship plays a great part in the economies obtained and standardization implies quantity."

Brick and Stucco Home



Simple and Artistic Design

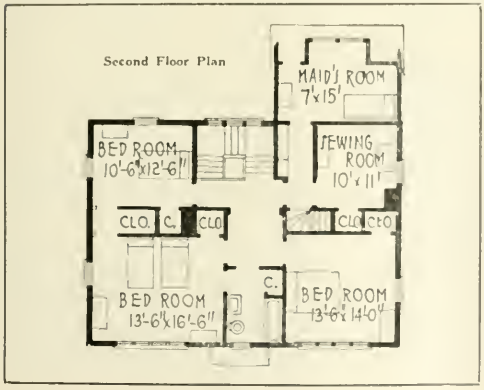
BEAUTY can be secured by handling the ordinary materials of building construction effectively and a very interesting example of this is shown in the artistic little house shown here.

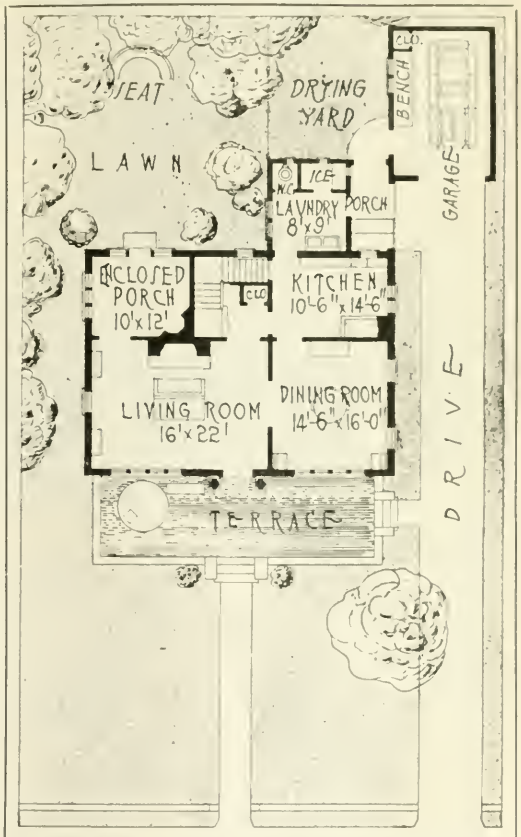
It is free from superfluous ornamentation and possesses a charming dignity that is unusual in just a plain rectangular gable end house without dormers.

As shown on the plot diagram given with the first floor plan the house is placed almost in the center of a sixty by one hundred foot plot and from all points presents a picture. Its charm is due to proper setting.

The view is not all from the outside, as particular attention has been given to securing a pleasing vista from the interior. From the enclosed rear porch one looks out on a tree and shrubbery enclosed garden, the drying yard is separated from it by an ornamental lattice fence that serves as a good background for flowers.

This house was built for Mr. Allan Reed at Wyncote, Pa., from plans prepared by De Armond, Ashmead & Bickley, architects, of Philadelphia.



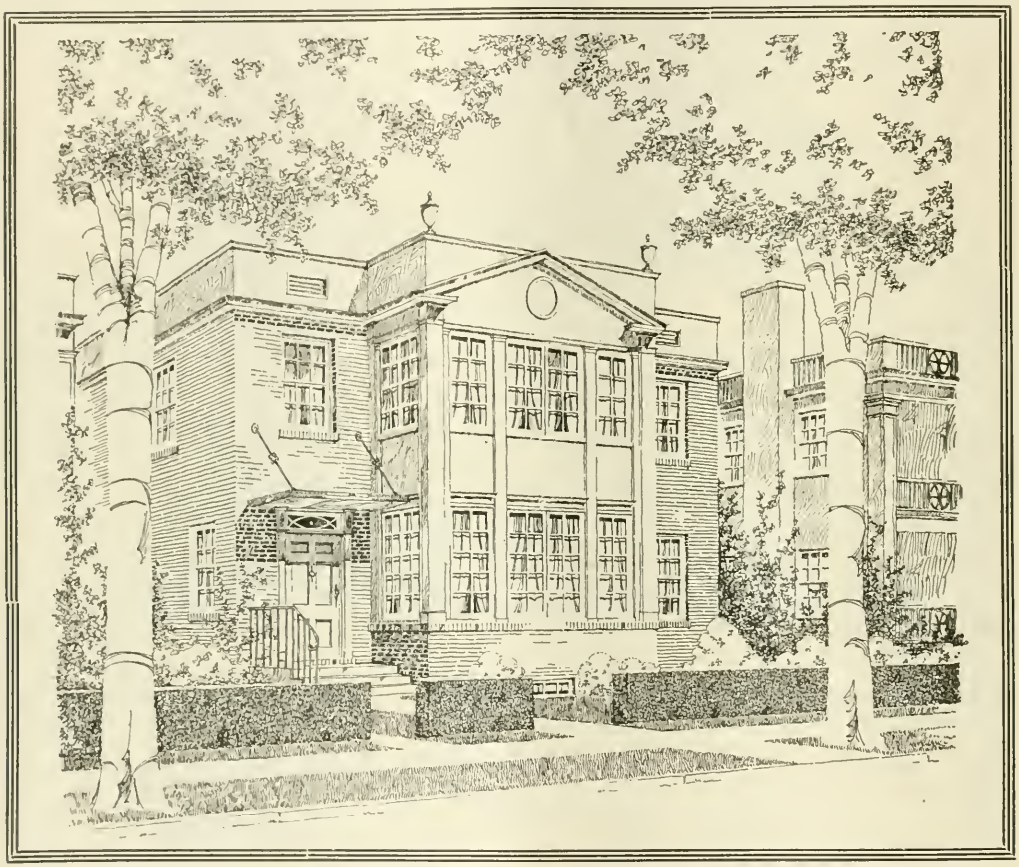


Careful Intelligent Planning Results in an Artistic Setting for this House on a 60 x 100 ft. Lot.

Two Family House Design

Interesting Practical Plan With Six Convenient Rooms to Each Apartment Specially Designed for Readers of Building Age and The Builders Journal

By R. C. HUNTER & BRO., Architects, New York



THE three bedrooms to each apartment give accommodations for a rather large family. A single main entrance serves both apartments while the service entrances are each entirely separate. The main vestibule is the only common meeting place of both families. This privacy is to be desired.

The plan arrangement of both floors is almost identical, the kitchens, bathrooms, etc., and all main partitions are plumb over each other. This makes for economy in construction. There are separate side entrances which serve to reach kitchen as well as cellar.

The small private hall serves the bedrooms, the dining room and the kitchen in a convenient manner.

The living rooms extend across the front of the house and open into a pleasant sun room. These sun rooms are arranged in a bay that forms a feature of the exterior and that gives light to the living room. Each living room has an open fireplace.

The house is designed along Colonial lines, brick veneer and stucco on frame and with wood trim.

This house could be built on a fifty foot lot without cramping and with a drive on one side; it is a type well suited to a city lot or a closely developed suburban district.

We give opposite a complete itemized bill of materials required for the erection of this house. Complete plans and specifications of this Two-Family House Design will be furnished for a nominal sum by BUILDING AGE and THE BUILDERS JOURNAL.

Quantity Survey of Two Family House

Shown on Preceding Page

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc Minor outs have been disregarded.

Such items as clearing site, temporary work and protection, scaffolding and general equipment and supplies, have not been included.

Such items as are marked "Unit," are to be estimated in a lump sum, following requirements of plans and specifications

Excavation

(Excavation for pipe trenches not included)	
Excavation for cellar	388 cu. yds
Excavation for footings	11 cu. yds
Excavation for areas	6 cu. yds
Excavation for trench walls	4 cu yds
Backfilling around walls, etc.	58 cu. yds

Masonry

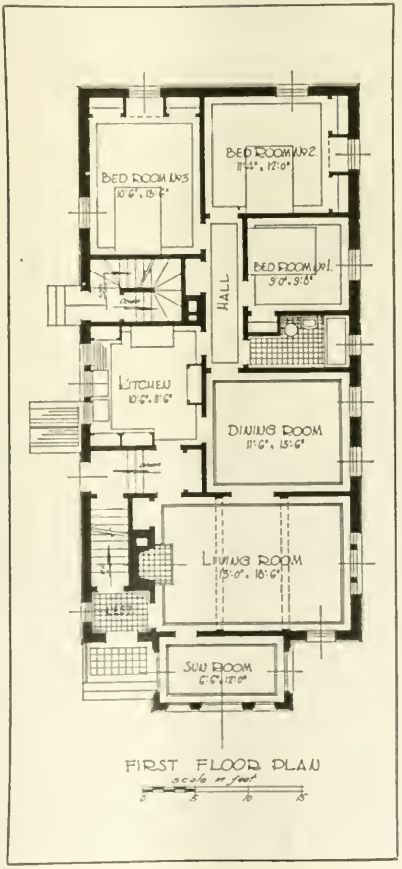
Concrete work.	
Concrete for cellar walls	1060 cu. ft.
Concrete for footings	438 cu. ft.
Concrete for trench walls	69 cu. ft.
Concrete for area walls	65 cu. ft.
Cellar floor (3" concrete and 1" cement finish)	1327 sq. ft.
Outside cellar steps (concrete, cement faced)	40 sq. ft.
Outside granolithic steps, etc. (4" conc. 1" cem.)	72 sq. ft.
Concrete forms	2700 sq. ft.
Pointing cellar window sills	27 lin. ft.
Finishing concrete foundation above grade	350 sq. ft.

Brick Work

Common brickwork for chimneys (or 4 M.)	190 cu. ft.
Brick veneer for outside walls (or 16 M.)	2200 sq. ft.
Brick for firestopping	4 M ..
Face brick for fireplace hearth and jambs (or 280 brick)	40 sq. ft.
Fire brick for fireplaces (or 250 brick)	50 sq. ft.
8" x 12" T. C. flue lining	94 lin. ft.
3" bluestone chimney caps, 1'6" x 2'6"	1 unit ..
1'10" x 3'0"	1 unit ..

Mason's Iron Work

Steel lintels, 4" x 3" x 5/16" angle, 2/9-2/7-1/4	36 lin. ft.
Wrought iron rail for entrance porch, (4'0" long, 3'0" high)	1 unit ..
Wrought iron rod for marquee, (5/8" dia. with turnbuckle, anchor, eye, etc.)	2 units ..
Fireplace damper (3'0" opg. with throat, etc.)	2 units ..
C. I. ash dumps	1 unit ..
C. I. cleanout door for ash pit, (16" x 12")	1 unit ..
C. I. cleanout doors for flues (8" x 8")	2 units ..
Thimbles for boiler flues	2 units ..



Plastering

Three coat patent plaster on wood lath—	
Gross	1460 sq. yds
(Net 1300 sq. yds.)	
Stucco on metal lath	110 sq. yds
Keenes' cement on metal lath, (behind kitchen range)	6 sq. yds
Keenes' cement caps	20 lin. ft.
G. I. Corner beads	130 lin. ft.

Tile Work

Tile for Vestibule:	
Floor (ceramic mosaic)	79 sq. ft.
Base (6" sanitary)	14 lin. ft.
Tile for Bath Rooms:	
Floor (1" hex.)	66 sq. ft.
Wainscot (3" x 6")	280 sq. ft.
Base (6" sanitary)	35 lin. ft.
Cap	64 lin. ft.

Sheet Metal Work

Metal roof on marquee	66 sq. ft.
Roof scuttle	30 sq. ft.
Flashing and counter flashing, (for roofs and chimneys)	175 lin. ft.
Flashing for cornices, etc.	320 sq. ft.
2" metal leader	10 lin. ft.
Roofing (Tar and Gravel)	1400 sq. ft.

Carpentry

Timber.	
(All No. 1 common stock, hemlock, rough	
Sills, 4" x 6" 4/18, 3/16, 4/14	352 F.B.M.
Posts, 4" x 6" 8/18	288 F.B.M.
Studs, girts and plates, —cellar	
2" x 4" — 65/14	606 F.B.M.
3" x 4" — 9/14	126 F.B.M.
Studs, etc. — First floor.	
2" x 4" — 165/18	2000 F.B.M.
Studs, etc.—Second floor.	
2" x 4" — 155/18	1860 F.B.M.
Studs, etc.—Roof parapet.	
2" x 4" — 10/14	653 F.B.M.
1st and 2nd, floor joists.	
2" x 10" — 124/14, 76/12	4420 F.B.M.
2nd. floor ceiling joists.	
2" x 8"—56/14, 32/12.	1554 F.B.M.
Rafters, 2" x 6"—52/12, 40/12.	1080 F.B.M.
Floor and roof bridging, 2" x 3"—600 lin. ft.	300 F.B.M.
Sheathing, (7/8" x 8" shiplap unless noted).	
Walls ..to cover	2840 sq. ft.
Flat roofs..to cover	1420 sq. ft.
Sheathing paper (waterproof)	2900 sq. ft.
Grounds, 3/4" x 2" (surfaced one side)	3200 lin. ft.
Sheathing for cellar partitions (7/8" x 8" shiplap)—to cover	700 sq. ft.
Rough flooring (7/8" x 8" shiplap, first and second stories—to cover	2600 sq. ft.
Furring (7/8" x 2")	300 lin. ft.

Exterior Finish

Cornice
- 7/8" x 6" soffit ... 190 lin. ft.
- 2½" bed mould ... 190 lin. ft.
- 2½" fascia ... 190 lin. ft.
- 4" crown mould ... 190 lin. ft.
- 7/8" x 4" skirt board ... 190 lin. ft.
- 1⅝" x 8" coping ... 160 lin. ft.
- 7/8" x 6" apron ... 160 lin. ft.

Pilasters, etc., sun room extension
- 1½" x 11" pilaster ... 84 lin. ft.
- ¾" x 8¼" pilaster ... 28 lin. ft.
- ¾" x 6" pilaster ... 84 lin. ft.
- 7/8" x 4" fascia ... 28 lin. ft.
- 7/8" x 12" frieze ... 16 lin. ft.
- 5/8" x 7/8" cove ... 28 lin. ft.
- Pilaster caps ... 8 units
- Pilaster bases ... 14 units
- Turned wood urns (7½" dia. x 23" high) ... 2 units

Cellar bulkhead:
- 7/8" x 4" M. & B. ceiling to cover ... 50 sq. ft.
- 7/8" x 6" fascia ... 20 lin. ft.
- 5/8" x 7/8" cove ... 20 lin. ft.

Louvres:
(Fixed louvres in wood frames, with wire screens on back)
- 2' 0" x 1' 0" ... 4 units

Roof scuttle:
- 3' 0" x 6' 6" batten door, etc. ... 1 unit

Windows:
Frames complete with sash, outside trim, etc. Sash 1½" thick, glazed D. T.

Cellar windows:
- Single top hung casem. sash 2' 0" x 1' 0", 2 light ... 2
- Single top hung casem. sash 2' 8" x 1' 0", 3 light ... 2

First and second floor windows:
- Single D.H. sash, 2' 10" x 4' 4", 12 light ... 17
- Single D.H. sash, 2' 0" x 4' 4", 8 light ... 3
- Single D.H. sash, 2' 0" x 3' 4", 8 light ... 2
- Double casem. sash, pr. 4' 0" x 5' 8", 20 light ... 3
- Single casem. sash, 2' 0" x 5' 8", 10 light ... 2
- Double casem. sash, pr. 4' 0" x 4' 4", 16 light ... 3
- Single casem. sash, 2' 0" x 4' 4", 8 light ... 2
- Triplet D.H. sash, ea. 2' 2" x 3' 4", 12 light ... 2
- Triplet D.H. sash, (1) 2' 10" x 4' 4", (2) 1' 0" x 4' 4" ... 2

Exterior door frames:
- 1¾" thick rabbeted. Complete with outside trim.
- Frame for front entrance door, 2' 10" x 6' 8", fixed transom sash 2' 10" x 1' 0" glazed leaded glass, ornamental trim, etc. ... 1 unit
- Frames for side entrance doors, 2' 8" x 7' 0" ... 2 units

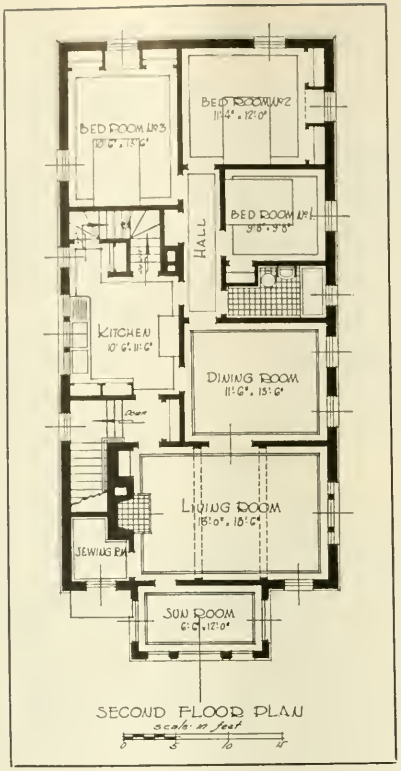
Exterior doors (all to detail):
- Front ent. door 2' 10" x 6' 8" x 1¾", 6 panel ... 1 unit
- Side ent. doors 2' 8" x 7' 0" x 1¾ glazed ... 2 units

Finished flooring:
- 13/16" x 2¼" oak—to cover ... 2500 sq. ft.
- Lining paper under floors ... 2500 sq. ft.

Joist hangers (¼" x 2" W I)
- For 2" x 10" beams ... 10
- For 4" x 10" beams ... 6

Interior Finish

Door trim (whitewood):
7/8" jambs, ½" stops, 7/8" x 4½", moulded and mitered with wall moulding. Trim both sides.
- For doors 2' 6" x 6' 8" ... 21 sets
- For doors 2' 4" x 6' 8" ... 9 sets



SECOND FLOOR PLAN
scale: in feet

- For pr. doors 4' 0" x 6' 8" ... 6 sets
- For pr. doors 3' 0" x 6' 8" ... 10 sets
- For cellar doors 2' 10" x 6' 8" ... 2 sets

Trim for inside of exterior doors:
- For front entrance with transom, etc. ... 1 set
- For side entrance 2' 8" x 7' 0" ... 2 sets

Trim for windows (whitewood): 7/8" x 4½" moulded and mitered trim with wall moulding, ½" stop, 1⅛" moulded stool, 7/8" moulded apron, 5/8" x 7/8" cove under stool.
- For windows, single, 2' 10" x 4' 4" ... 17 sets
- For windows, single, 2' 0" x 4' 4" ... 3 sets
- For windows, single, 2' 0" x 3' 4" ... 2 sets
- For windows, double casem., pr. 4' 0" x 5' 8" ... 3 sets
- For windows, single casem. 2' 0" x 5' 8" ... 2 sets
- For windows, double casem., pr. 4' 0" x 4' 4" ... 3 sets
- For windows, single casem. 2' 0" x 4' 4" ... 2 sets
- For windows, single, 2' 0" x 4' 4" ... 2 sets
- For windows, triplet, each 2' 2" x 3' 4" ... 2 sets
- For windows, triplet (1) 2' 01" x 4' 4", (2) 1' 0" x 4' 4" ... 2 sets

Base:
- (7/8" x 6" moulded) ... 600 lin. ft.
- 2" base mould ... 600 lin. ft.
- Picture molding (7/8" x 2¼") ... 500 lin. ft.
- Mantels for living rooms ... 2 units

Interior doors:
(2 cross panel birch veneer)
- Door 2' 6" x 6' 8" x 1⅜ ... 21
- Door 2' 4" x 6' 8" x 1⅜ ... 7
- Door 2' 4" x 6' 8" x 1⅜ glazed ... 2
- Door pr. ea. 2' 0" x 6' 8" x 1⅜ glazed ... 6
- Door pr. ea. 1' 6" x 6' 8" x 1⅜ glazed ... 10
- Door 2' 10" x 6' 8" solid pine ... 2
- Door 3' 0" x 6' 8" solid pine ... 2
- Whitewood doors to plumbing pipes. 1' 6" x 3' 0" x 1⅜" ... 2

- Closet shelving (7/8" x 12" pine) ... 110 lin. ft.
- Hook strip (7/8" x 4") ... 130 lin. ft.
- Rabbeted shelf cleat ... 80 lin. ft.
- 1" dia. pipe clothes rod ... 38 lin. ft.

Kitchen cupboards:
(With countershelf, drawers, doors, etc.)
- Front 6' 0" x 8' 0" ... 2 units
- Front 4' 0" x 8' 0" ... 2 units
- Front 2' 8" x 8' 0" ... 2 units

Main stairs. First to second story:
- 14 risers, 3' 6" wide, box pattern, wall hand rail, etc. (birch) ... 1 flight
- Cellar stairs, first to cellar, 12 risers ... 1 flight

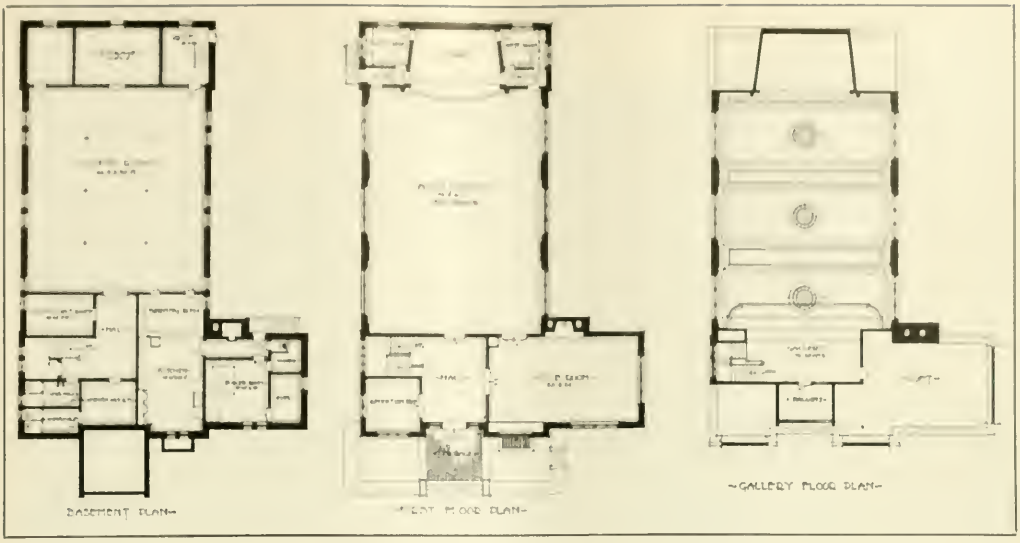
Service stairs:
- Cellar to first floor—12 risers ... 1 flight
- First to second floor—14 risers ... 1 flight
- Second to roof—14 risers ... 1 flight

General Conditions

Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges.

Allow for general work not listed, such as grading, planting, etc.

Include: sub-bids: Hardware and applying same, painting and decorating, plumbing and gas fitting, heating, electric work.



Model Club House

Interesting Design for a Community Building

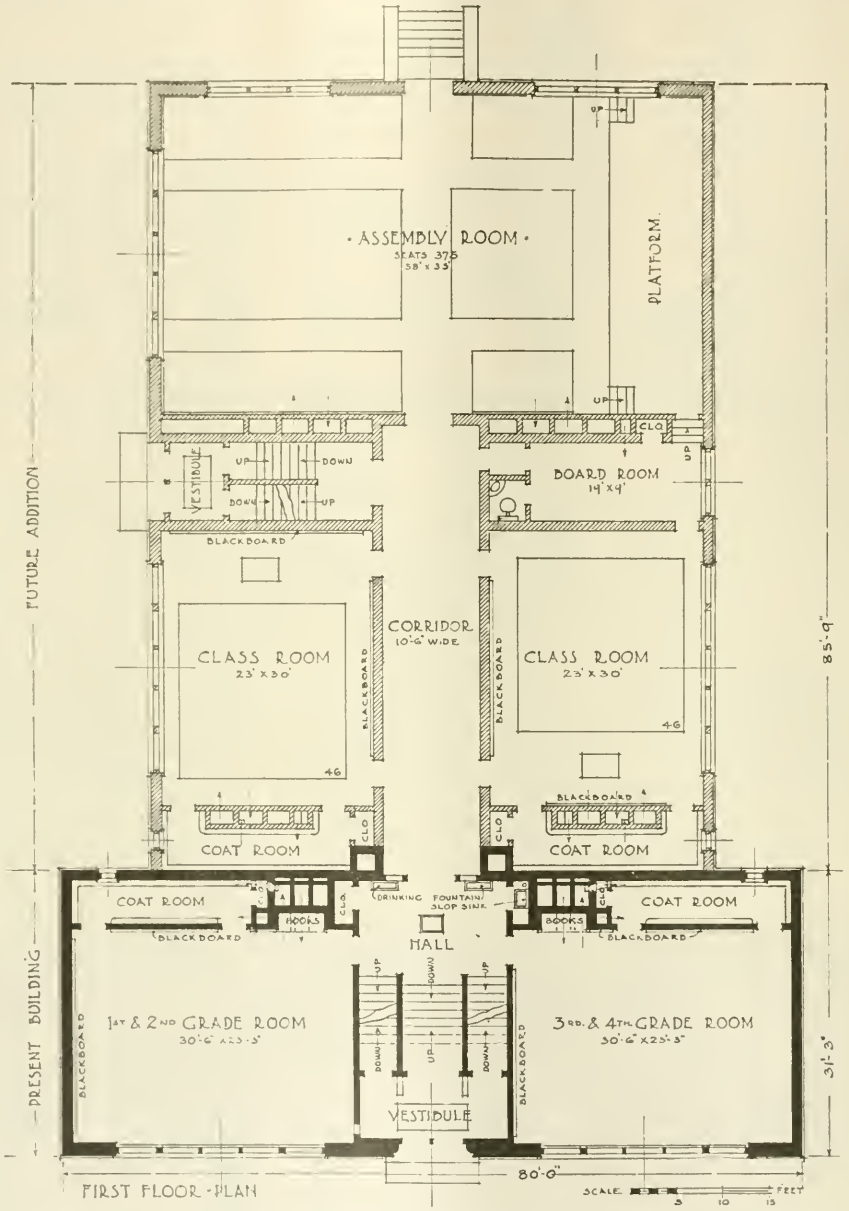
COMMUNITY interests more or less develop the club house idea and as this is quite an interesting subject, we think it is opportune to show here a good design of a successful country club.

This particular club house, as shown in the above picture, is the home of the Twentieth Century Club situated at Landsdowne, Pa. The exterior design follows English lines and is distinctly pleasing. It is set on a terrace and this adds to its looks.

An examination of the floor plans given above will show that every likely want has been well taken care of. There is a good size auditorium in which various meetings and entertainments are held. Directly underneath this auditorium there is a dining room, which is capable of accommodating quite a good sized crowd. There is also club room, smaller office rooms, etc., besides necessary toilet rooms. An adequate size kitchen has been provided as well as sufficient room for the heating plant and coal storage.

This club house was erected from plans prepared by Heacock and Hokanson, Architects of Philadelphia, and the contractor of the job was George W. Grover of Morton, Pa.





• WHITPAIN • TOWNSHIP • CONSOLIDATED • SCHOOL •

C E SCHERMERHORN & WATSON K PHILLIPS
ASSOCIATE ARCHITECTS
FOUR THIRTY WALNUT STREET PHILADELPHIA



School Planned for Future

Pennsylvania School Design Arranged for Contemplated Addition

WHEN a school is being thought about some attention should be given to future needs as well as present requirements. This has been done in the Whitpain Township Consolidated School, erected near Bluebell, Montgomery County, Pennsylvania.

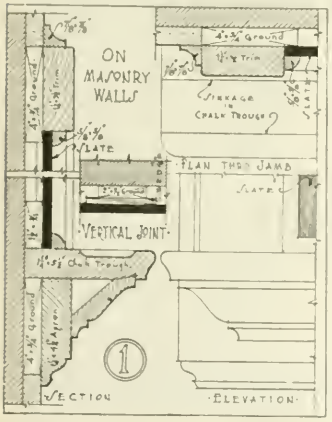
From the plan given on the opposite page future requirements have been planned for. The structure as shown in our picture consists of four class rooms, the new addition that will be built sometime in the future will contain six class rooms besides the large assembly room, which is to seat 375 pupils, this room, as well as all of the class rooms have been designed so that the pupils will receive the light from the left.

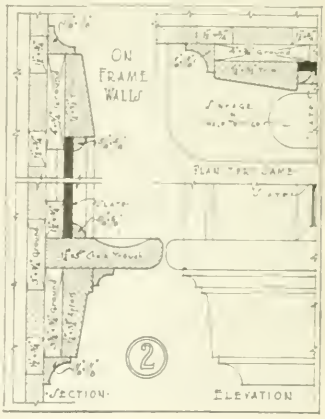
This school building is designed along the lines of English College buildings. The foundation is of local stone and above this brick is used with limestone trim. The building is heated and ventilated by a fan furnace system, the fan being operated by an electric motor.

This building was erected from plans prepared by C. E. Schermerhorn and Watson K. Phillips, Associate Architects, Philadelphia, Pa. The general contractor of the job was Alexander Chambley, also of Philadelphia.

As many builders are interested in the best way of erecting slate blackboards in schools, we give two details of approved methods of doing this, the one is suitable for brick wall, the other detail is for frame construction. These details were kindly supplied to us by the Structural Slate Company.

The use of slate in school buildings is steadily growing more popular; it makes excellent treads for iron stairs, toilet inclosures, and for shower bath stalls.







Private Garages

PRIVATE garage designs are common enough, but the two shown on this page are a little out of the ordinary. The top picture shows a one-car garage at Bethlehem, Pa., this is built of hollow tile covered with stucco, and has a tile roof, being in conformity with the house of the owner. Mr. C. E. Schermerhorn of Philadelphia was the architect. While the garage is of good design, its best points are emphasized by its attractive setting; flowering shrubs well placed have a lot to do with making a picture.

The lower picture shows a garage and summer house built at Lansdowne, Pa., from plans prepared by Bunting and Schregby, architects, Philadelphia. This is somewhat of a novelty, but of course is only possible on a side hill site. The garage proper is built of concrete, and there is nothing out of the ordinary in the design of this part of the structure, but instead of an ordinary roof, a porch-like treatment has been given to it, the roof proper being on top of this, the result being a very inviting summer house.





Neat Cottage Design

No Floor Space Wasted in This Five Room House

HERE is a small cottage design that is neat, well proportioned and tasteful. The exterior is covered with wide clapboards, the corners being mitered. The roof treatment is worthy of special mention as it is somewhat out of the ordinary, as it has a thatched effect. The gable treatment is quite unusual, and certainly has been well handled.

From the angle our photograph was taken the chimney appears to be rather tall, but it is not higher than necessary to secure a good draft. The pitch of the roof is quite steep. This allows the walls of the rooms on the second floor to be square without any cut-off at the sides. The porch floor is cemented and four large colonial columns support the roof, as shown in above picture.

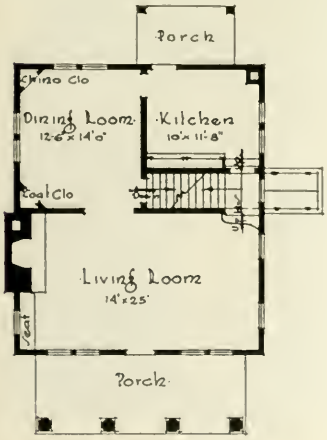
The house as will be noticed sets close to the ground. This takes away from the high appearance that it would have if it was elevated two or three feet above grade.

The room arrangement has been very carefully thought out to secure the maximum amount of comfort from the minimum amount of room. The living room is of good size and goes across the entire front; open fireplace on the left hand side in the corner makes rather a cheery nook of this part of the room, a seat extends from fireplace to front wall

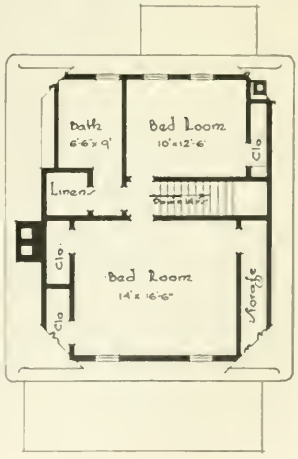
The dining room is small but ample in size for the necessary furniture without being the least bit cramped. The light kitchen with its cozy and compact arrangement will certainly please the housewife.

Two bedrooms and bathroom are provided on the second floor. There is a minimum amount of hall space so there is practically no waste space whatsoever.

This home shown here was designed and built by J. Walter Ketterer, Architect, of Butler, Pa., for his own occupancy.



First Floor Plan



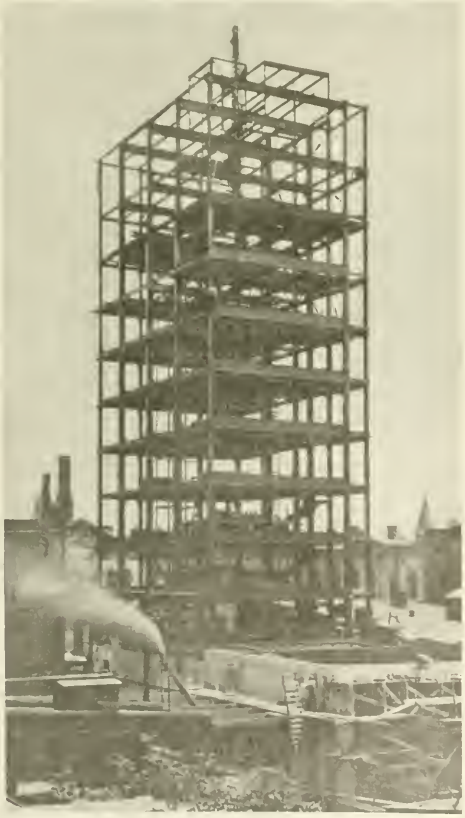
Second Floor Plan

Rapid Building Construction

12 Story Office Building Erected in 294 Days by Hoggson Bros., Builders, New York



Pop's Lunch Room Occupied the Site of the New Building Until February 1, 1921.



On May 1 All Steel Work Erected and Masonry Work Completed for First Story



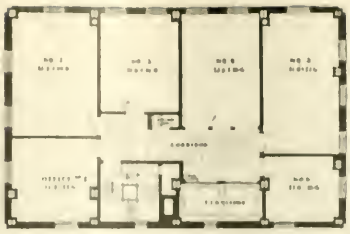
The Bank and Office Building Completed Ready for Occupancy November 21, 1921.

BUILDERS are always interested in the rapid execution of a contract and the pictures on the opposite page depict the condition and dates of a remarkable performance in the building of the Citizens Trust Company, at Terra Haute, Ind. We believe the completion of this building in one of our smaller cities holds the record for such a performance.

The site of this bank and office building was occupied by a two story brick building up to February 1st, 1921, when its demolition began. Our next picture was taken on May 17th, 1921. This shows the entire structural steel work for the twelve stories in place, and the masonry work has just started. The third picture was taken on November 21st, 1921, and shows the entire structure complete and occupied on that date.

This entire building operation was completed in 294 days, including Sundays and holidays, and in this time the buildings on the site were demolished, excavation done, the proper foundations for the heavy structure placed, and the entire super-structure erected; besides, the bank proper had all its equipment installed including vaults, decorations and furnishings. All the offices on the upper floors were also in completed condition on that date.

Of course an operation like this cannot be carried on except by a systematic building organization. Hoggson Brothers of New York and Chicago, designed as well as erected this building. Material had to be ordered in advance and scheduled to be delivered at the time it was needed. It is to the credit of Hoggson Brothers' system that everything went like clockwork.



Arrangement of Upper Floors

It is not to be wondered at that such a building operation in a city like Terra Haute, Ind., should have caused quite a good deal of comment. It is the tallest building in that city and to have it erected in such record time gave the natives something to talk about. Naturally, the Citizens Trust Company received a good deal of desirable publicity through the building activity that they instigated.

This building, as has been stated, is twelve stories high. The steel framework is enclosed with brick walls, exterior being faced with dark red pressed brick, with base of limestone. The cornice is of ornamental Terra Cotta.

The office part of the building is built as sort of a tower so as to provide permanent light and air at the rear. The building is equipped with two speedy elevators with an automatic device, which insures cars being brought to a stop at level of floor.

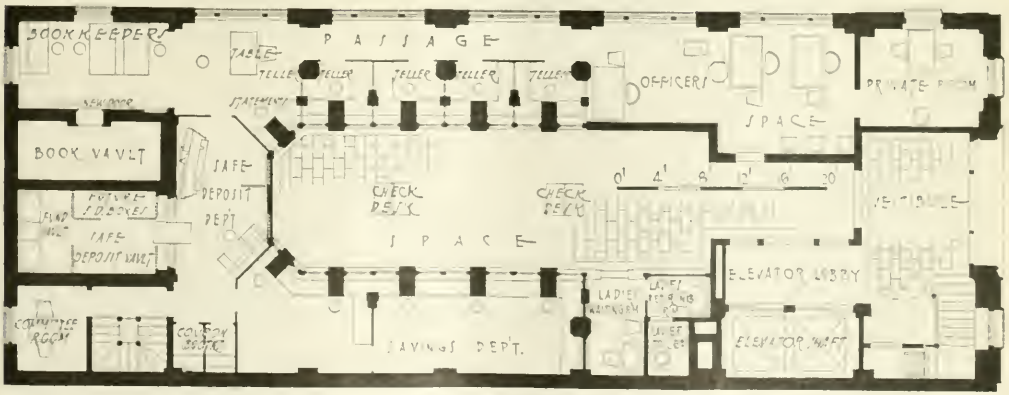
There is a visitors' promenade around the roof from which an extensive view of the surrounding country can be obtained.

The upper diagram shows a typical floor plan from the second to the eleventh floor inclusive. On the second floor the space designated as office No. 6 is occupied by the main stairs. Office No. 3 on the seventh floor is occupied by the ladies' toilet and the same space on the eighth floor is given over to the men's toilet.

The lower plan shows the arrangement of main floor. The bank and offices are reached through a common entrance. The banking room occupies the entire first floor together with front and rear mezzanines.

Our plan also shows the arrangement of the banking space. Particular care has been taken in the planning, so as to obtain maximum efficiency from bank help with the greatest convenience to customers.

Of course, the equipment and vaults are in accordance with the best modern practice. The banking room receives light from the large side windows, and skylights in the roof. The counter in the banking room is of Tavernelle Fleuri marble. The public space has a Tennessee marble block floor. The woodwork, the desks, etc., are of mahogany. The several large columns that appear in the banking space have ornamental caps, fashioned after the composite order. The beams are of ornamented plaster in harmony with the other architectural details.



The Arrangement of Ground Floor, Showing Office Building Entry and Layout of Banking Space

WHY THE ROOF FELL

Startling Disclosures in Court Proceedings Strip the Brooklyn and Washington Theatre Disasters of Supposed Mystery, Over 100 Lives Sacrificed to Ignorance of Proper Construction

ONE primary fault was not the cause of the collapse of the roofs of the American Theatre in Brooklyn, New York, or the Knickerbocker Theatre in Washington, D. C. In both cases it was a combination of many small faults, any one of which alone would not have caused the catastrophes. Just what started the collapse in each case perhaps will never be learned as both occurred so swiftly with complete wreckage.

That the steel work of the American Theatre, at Bedford and Park Avenues, Brooklyn, was constructed on plans not approved by the Building Department and that the work was practically completed before the plans submitted to the Building Department were approved was brought out at the hearing to fix responsibility for the collapse of the structure and the consequent loss of seven lives.

The plan examiner employed by the Building Department, who had complete and final authority as to the safety of the plans for the new theatre, asserted that on Oct. 7, 1921, and again on Oct. 25, 1921, he objected to the plans for the steel work submitted to him by Joseph Gaydica, to whom the contract was awarded for furnishing the steel.

There were twenty-one objections to the plans. The most important was the absence of cross-framing between the transverse trusses on which the roof of the theatre was to rest; the lack of sway braces in spaces between certain of the trusses; a failure to provide sufficient knee joints on several trusses that rested on the longitudinal truss, and the fact that the trusses were not anchored into the walls of the building by bolts fastened to the trusses and cemented into the walls. These changes appeared in the plans as finally passed on Nov. 2, 1921. The roof collapsed on Nov. 29, 1921.

Further testimony brought out the fact that the steel supporting column which bore nearly one-quarter of the entire weight of the roof was set into place without the supervision of the steel contractor and the bearing plate was a patch-work of small pieces of steel!

This column was plumbed by eye only, so the steel erector testified. In our January issue we called attention to the fact that it was the slipping of this column that caused the collapse. Is it any wonder?

It seems the original plan called for a wall but the substitution of columns would provide room for seventy additional seats.

AT the Coroners' inquest of the Knickerbocker Theatre disaster in Washington, a report was made by five Army and Navy engineers on the cause of the collapse which was attributed to a failure to sufficiently provide for the unusual conditions existing at the junction of the curved Columbia Road wall to the stage wall.

The 21 "evidences" of weakness in the structure, as set forth in the Army and Navy experts' report follow:

Use of tile walls to carry heavy concentrated loads.

The unusual height and length of the unsupported tile wall on Columbia Road.

Lack of a column with knee brace or pilasters under the main truss at the wall.

Inadequate bearings of beams on the tile wall with small bearing plates, regarded as particularly important in conection with the "skew" bearings.

Absence of concrete fill in the tile at beam bearings with wall bearing plates on edges of tiles.

HERE are the official facts of two lamentable building catastrophes, in each case ignorance of proper construction methods was the root of the trouble. "Guess" should be eliminated from building. Any one entrusted with the safety of many lives must know what is safe or unsafe construction.

Insufficient anchorage of steel to walls.

Roof slab too thin for span and loading and insufficient steel reinforcement.

Absence of restraint at sides of roof slabs.

Ceiling load concentrated in centre of roof slab.

Short bearing of main truss on lintel, and truss not stiffened for bearing.

Absence of bracing between steel members, and particularly at ends of main truss.

No stiffness in connection of main truss to column.

Use of bolts instead of rivets on all field connections and insufficient bolts at truss connections.

Column top and splices not milled.

Reinforcing steel in roof slab was not raised over the beams to take negative bending over supports.

No evidence of increase of re-in forcement in end panels of slabs.

Heavy load of nine and one-half inches of cinder concrete fill at centre of drainage ridge.

Loads of ventilating equipment where cinder fill occurred and absence of special bracing to take vibration.

Defective detailing as witnessed by absence of splices for chord and end post cover plates.

All tile not hard burned and some have scant webs and walls, notably at top of Columbia Road wall.

Insufficient bonding between front and back tile in Columbia Road wall.

It was also brought out in the inquiry that the plans on file with the Building Department called for a main truss nine inches longer than that which on inspection of the ruins was found to have been used. The plans were approved and a permit issued without the builder being required to furnish detailed specifications, as is usually the case, for all metal work.

Development Field Offices





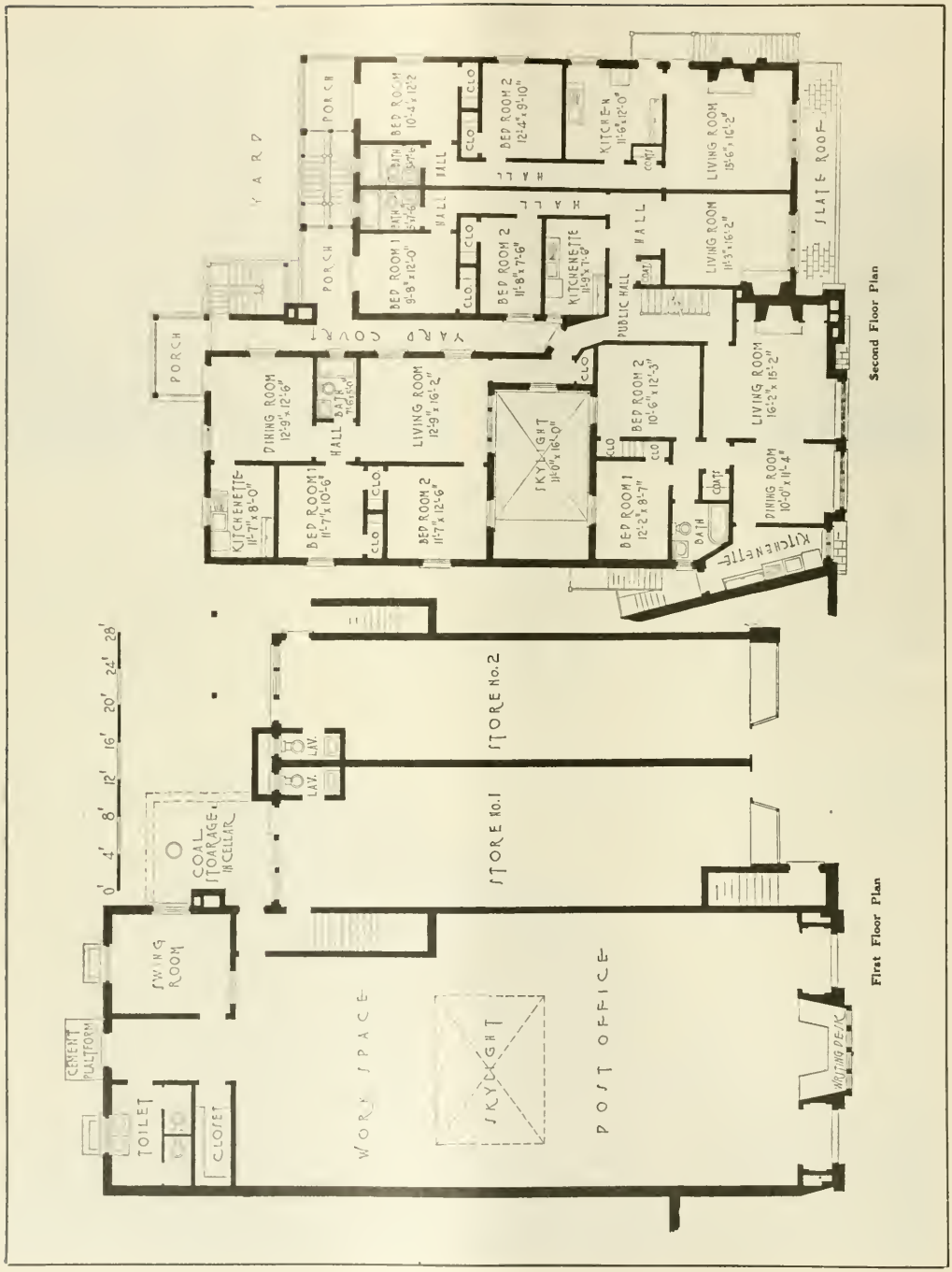
OPENING a new tract of land for sale in lots, the experienced developers use different methods to get people interested to buy. Of course the necessary grading, sidewalks, water and gas pipes, electric poles, etc., will have been installed and an attractive name selected for the property.

The builder is often called upon to submit a design for such a building and the three buildings shown on this page will give some valuable suggestions. There is nothing elaborate about any of the designs, but they are simple, in good taste and can be built at a moderate price.

In the upper design note how the roof has been laid of red and green chipped slate composition shingles, thus obtaining novel effect. The lower design with its large latticed porch is very inviting, it gives a feeling of hominess at once. The upper picture is a quaint little house with an attractive outside chimney.

In erecting these field offices one should avoid freak or ugly buildings with their sides covered with lettering about the wonderful bargains in lots. An attractive field office is one of the best ads a builder can have in a new location. Let your good work appear here, it will be critically examined and if well done will mean good jobs for you in the near future.




First Floor Plan
Second Floor Plan
POST OFFICE
WORK SPACE
STORE No.1
STORE No.2
SKYLIGHT
SWING ROOM
TOILET
CLOSET
CEMENT PLATFORM
COAL STORAGE IN CELLAR
LAV.
WRITING DESK
YARD
PORCH
DINING ROOM 12'9"x12'6"
BED ROOM 1 11'7"x10'6"
KITCHENETTE 11'7"x8'0"
HALL BATH
LIVING ROOM 12'9"x16'2"
BED ROOM 2 11'7"x12'6"
SKYLIGHT 11'0"x16'0"
BED ROOM 1 9'8"x12'0"
BED ROOM 2 11'8"x7'6"
KITCHENETTE 11'9"x7'8"
PUBLIC HALL
BED ROOM 2 12'4"x9'10"
KITCHEN 11'6"x12'0"
LIVING ROOM 15'6"x16'2"
SLATE ROOF
BED ROOM 1 12'2"x9'7"
BED ROOM 2 10'6"x12'3"
DINING ROOM 10'0"x11'4"
LIVING ROOM 16'2"x16'2"
BATH
CLO.
CONT.



Old English Design for Stores and Apartments

Quaint Fronts on Modern Buildings Produce Striking Effect

MAIN street in most of our American towns presents a rather monotonous appearance as far as the buildings go. One structure is practically the same as the other—just a common store front with perhaps a three window arrangement upstairs for the apartment and decorated on top with the conventional cornice. There is practically no beauty or individuality in their design. One can look in one town and really see the Main street of most of the others.

Builders can overcome this lack of artistic design in the future by suggesting to their clients the desirability of putting up something that is a little more artistic. Speak about the advertising value an attractive structure will have, it gives people something to talk about, and that is what a business man wants.

Banks have been vieing with one another to produce good looking structures for their business homes, but other merchants can do just as much in their own way. There is really no excuse for an unattractive modern commercial or flat building.

We show above a very unusual and artistic apartment building with stores below; the larger store is occupied as a post office, and this part alone would be a very attractive building, but linked with the others it really forms an interesting picture. The idea of putting the large chimney in the front is a very unusual feature, but very striking.

This attractive building was built at Upper Montclair, N. J., from plans prepared by Francis A. Nelson, Architect, New York, the construction was done by Messrs. Peterson and Benson, builders of Montclair, N. J.

This store and apartment dwelling is built of brick and the use of face brick together with certain portions in stucco with ornamental half timber effects, forms a very striking front. Having one portion of the building set back from the front line is another innovation that creates a better appearance.

The entrance to the main apartments is from the side instead of the front, as is ordinarily done. The right hand side apartments are reached by an outside stairway which to some would appear rather strange, this stairway however, is only temporary. The development of the adjoining property contemplates carrying out the same style architecture, and joining it to this right hand end of the present building; the outside stairway will then be replaced by a regular stair and hall.

The roof, as will be noted, is covered with thick slate shingles laid at random in the Old English fashion; the slate is of variegated colors, so an artistic looking roof results.



Metal Lumber Joists in Place for Fire Proof First Floor of Residence

Fire-Safe Home Building

Practical Low Cost Methods of Building Fireproof Floors in Small Houses Thereby Reducing the Fire Hazard

By GILBERT CANTERBURY

IT is rapidly becoming recognized among contractors and others of the building industry that in order to provide safety from fire in the dwelling house type of construction it is only necessary to use fire resistive materials at certain vulnerable points in the structure.

In the work of establishing these vulnerable points it has been developed that a goodly majority of dwelling house fire hazards are located in residence basements. The chief of these hazards are such equipment as furnaces, ash bins, hot water heaters, laundry stoves and fuel supplies, to which may be added gas meters, electric meters, horizontal pipes, hot air ducts, etc.

In considering the problem presented by this accumulation of hazards in one section of the home, fire experts have agreed that construction of a fire resistive first floor over the top of brick, tile, concrete or stone foundation walls will isolate the chief causes of fires and give a large measure of safety to the livable sections of a home regardless of the materials out of which the upper structure has been built. Compilation of reports by the National Board of Fire Underwriters covering a period of five years and some 3,500,000 fire insurance adjustments has disclosed that stoves and furnaces are responsible for fires causing loss of $55,133,181.00; hot ashes and coals $11,806,754.00; rubbish and litter $3,511,824.00; spontaneous combustion $49,702,886.00. It is obvious that most of the fires in dwellings coming under these classifications of causes would have their origin in the basement.

The contractor, bearing in mind these facts, has made the discovery that fire safe construction can be applied to dwellings at surprisingly low cost. The four basement walls of homes are invariably constructed out of incombustible materials and since the first floor, which formerly was universally constructed out of wood, has been proven the most vulnerable point, the simple remedy has been found to be the elimination of combustible material in the under side of this floor.

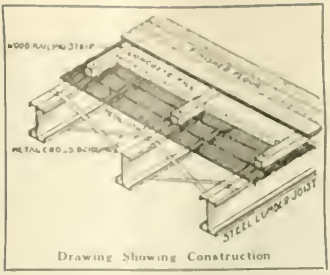
Numerous methods of building the first floor fire safe have been tried in various parts of the country and one method known as the steel lumber firesafe first floor has been growing rapidly in popularity. In this construction, light steel joists are used as floor supporting material. Metal lath is spread over the tops of the joists and 2x2 wood screeds run lengthwise with the joists, the attachment being made by driving nails down through the lath into the steel joist web. Concrete, either stone or cinder, is then filled in between these screeds and the usual hardwood surface applied by nailing into the screeds. This eliminates all combustible material from the under side of the first floor and yet preserves the desirable wood surface. The total extra cost of a home using this system amounts to only about one per cent. or from one to two or three hundred dollars, according to the size of the building.

According to insurance statistics, fires occur in American dwellings at an average of eight hundred and eighty-nine per day. It has become popular practice to charge the majority of these fires up to carelessness but contractors, architects and others in the building trade know that the one and only efficient way to eliminate fire loss is to build structures so that they cannot burn. It has been es-

timated that a universal adoption of the fire safe first floor principle in dwelling construction would eliminate seventy-five per cent, of our annual fire loss in this class of building. Such a result would mean the economic saving of many millions of dollars every year.

The fire safe first floor principle in dwelling construction developed over a period of several years and is now recognized by building codes of most large cities and made compulsory for multiple residences, apartments, etc., has recently spread to other types of buildings, notably the public school house.

The chief fire hazard of the school house is the heating and ventilating equipment usually located in the basement. At the last meeting of the National Education Association, Division of Superintendence, the following remarks on this subject were made by Mr. J. Albert Robinson, Safety Engineer: "The value of good construction is universally recognized. We are all familiar with the common types of fireproof construction and building materials in use. The several types of construction which are being developed by the steel industry are not yet so well known. It is of very great interest in view of the present cost of building to learn that at only a slightly increased cost over that of ordinary construction the most hazardous portions of the school building may be segregated or cut off by the use of a steel lumber fire safe first floor."

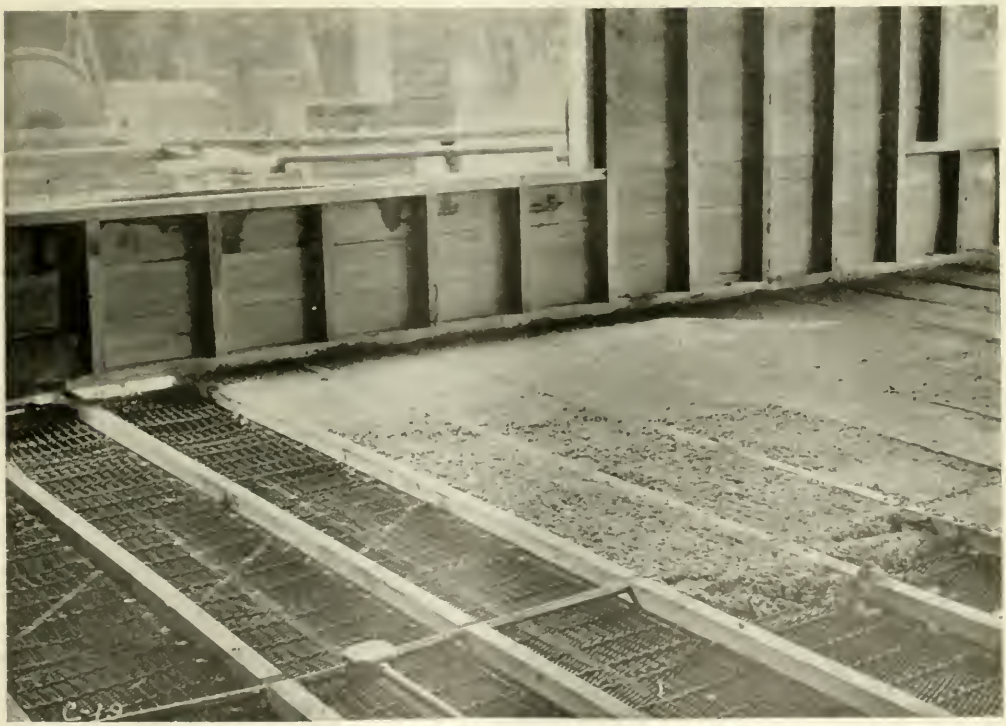


Drawing Showing Construction

Floors in hundreds of school buildings have been built after this manner in the last few years. In the state of Ohio alone ninety-six school buildings have been erected with this type of fireproof floor and the size of these buildings vary from the large city high schools in the state to small township schools in the rural sections.

In the accompanying illustrations are shown the steel joist skeleton of a fire safe first floor of a dwelling at Decatur, Illinois, also a close up view of the upper side of the floor showing the metal lath and wood nailing screeds in position and the concrete filler just being spread. The wall construction above the first floor, it will be noted in this picture, is of wood.

Aside from the fire resistive feature of the metal lath and concrete floor supported by steel joists, it is worthy of mention that this construction is also vermin-proof and that it can not warp or sag.


How the Concrete Floor Is Laid on Metal Lath. Note the Sleepers for Nailing Wood Floor

Should We Build Now?

Here Are Some Facts and Figures to Help Contractors Answer the Question of the Intending Home Builder

SECRETARY of Commerce Hoover is the home-builder's friend. At least he is consistently advocating and actively encouraging the erection of more homes for the people of the United States. And President Harding himself is as domestic and home-loving a man as can be found in the republic. All official Washington is keenly interested in the subject of homes, not only because homes are the normal and happiest domicile of men and women, but because that nation is most self-reliant whose lines of strength lead straight to the hearthstones of a contented and home-loving people.

This year brings a nation-wide renewal of home-building discussion. With the spring building season at hand this is the time for planning and visualizing the new home with all of its innate appeal to the best instincts of men and women. Many thousands of people have dreamed of that beautiful home that some day they intend to build. But year has followed year and the joys of the new home have never been realized.

Will 1922 be a good year to build a home? Experts declare that it will be. For practically all building materials are down to as near pre-war levels as they are likely to go under the new conditions confronting the world. This is especially true of lumber which is being procured at almost pre-war cost and is being sold by retailers generally at figures as low as the present high cost of handling and transportation will permit. In the very nature of things lumber is expected to advance because of the decreasing supply of forest timber. The man who builds now may be reasonably sure that in the long run he is fully protected in his investment.

But suppose some items of construction do become cheaper. The man who lives in his own home can save enough in rent in a single year to offset any likely temporary reduction in materials, and after that he may be reasonably sure his home cannot be duplicated for less than it cost him. Build now, is the advice of those who know building conditions. And already there are indications of such a renewal of building that probably by the middle of the next building season an advance in the general cost of materials will set in that will represent substantial profit to those who take advantage of the building conditions of early spring.

THE housing shortage in this country will not be overcome within the next five years, even with the best of good fortune. This statement was made by John Ihlder, manager of the Civic Development Department of the Chamber of Commerce of the United States, before the recent housing conference of the American Society of Civil Engineers.

Mr. Ihlder said that even the well-to-do would not be as adequately provided with good housing in 1927 as they were in 1914.

"As for the wage-earner, let alone the poor, their problem will be with us a good deal longer," he said. "Consequently it is part of common sense to base our proposals on the proposition that the campaign will be long continued and that whatever is to produce results must be economically sound." Mr. Ihlder pronounced as dangerous some of the so-called "emergency" housing legislation. He pointed out that during the last two years there has been legislation not based upon any deep study, and designed merely to check, temporarily, certain abuses from which a vocal part of the community is suffering. Legislation designed, not to cure, but simply to reduce irritation, he said, is likely to have effects quite unlooked for.

Mr. Ihlder explained that during the war he was an advocate of government housing for war workers.

"That was a time of real emergency and it had a definite terminal point, the end of the war," he said. "Today the situation is fundamentally different. What we do now has no definite terminal point. Any date we may set is easily changed. What we do now sets precedents.

Speaking of building costs, Mr. Ihlder said that "so far as experience goes, such short cuts to the millennium as government building and management do not promise to reduce real costs. Government operation, not only in this country but in others whose distance gives a haze of enchantment, has, as a rule, proved clumsy, inefficient, and expensive. Certain functions must necessarily be performed by government, but the burden of proof is always on those who would transfer new functions to the government. So far, proof is lacking that governmental construction or management of housing would produce better or as good results in America as would private. But at the same time those of us who hold to this belief must recognize that dissatisfaction with present housing conditions is causing a growing sentiment for direct participation by the government. Our only effective answer is to produce better results through private operation.

"In brief then, the kind of housing legislation which, because of experience, we can count upon to aid, is regulatory, the kind that protects the men who would contribute to the public wealth from the exploiter who would prey upon the public wealth. This kind of legislation, building codes, housing codes, city planning and zoning ordinances, we should perfect and promote, confident that if well devised it will encourage building because it will make investment more secure."

WITH regard to the building industry, in an interesting letter to the editor, S. W. Straus & Co., say:

"There is a continued improvement to be noted in underlying conditions of the building industry, and it is expected that activities during the ensuing year will be on a very heavy scale. There is a healthy inquiry for capital for building purposes, particularly for residential improvements and a large proportion of the outflow of capital for the building industry is being absorbed in financing the construction of these types of structures."

SHOPWORK *and* FURNITURE

Designs for the Finish Man



Diningettes

Two Interesting Designs for Modern Homes

KITCHENETTES are well-known features of small apartments and bungalows and so are breakfast nooks and dining alcoves and now we are coming to the "Diningette."

The high cost of building in the past few years made folks think about space saving and much planning was done to have all the comforts in the smallest possible number of square feet.

Big formal dining rooms are slowly being eliminated from the small home and apartment house designs and this tendency is being reflected in the sharp decline in the demand for dining room sets.





Here are two pictures of the new "Diningette." The top picture shows a simple arrangement of china closet with serving table in shelf form, this being set high enough so that a tea wagon will go under it.

The lower picture shows a neat and cozy arrangement of diningette with its attached kitchenette. Here is a tabloid arrangement that is hard to beat, every comfort is compressed in the minimum amount of room. A "mealette" can be prepared and served here that will taste as good as a banquet in some elaborate dining room.

In designing and building such kitchenettes and diningettes the builder should be sure to introduce the different features that will appeal to the lady. Plenty of cupboard room is essential. Wall plugs and base plugs for different electrical appliances are required.

OFFICE and JOB MANAGEMENT

Things the other man has found out that save money



Short Method of Estimating

By I. P. HICKS

WE will now submit another plan and estimate by our short method of estimating. This time we have selected the plan of a full two-story house of the square build design. It is figured with the reception hall, living room, dining room, and the stairs (up to and including the landing) to be finished in oak, balance of house to be finished in yellow pine trim.

In order to avoid a difficult combination of fractions in the parts figured by the square the fractional parts of squares have been expressed in decimals, which makes accurate figuring a very simple process. The fractional parts of a square being represented by hundredths parts of a square, it is easy to figure any fractional part. This enables one to figure with the greatest of accuracy, leaving nothing to guess at.

Figuring the Mason Work

Excavating 216 yards, 40c	$86.40
Concrete footings, 76 cubic feet, 40c	30.40
Brick laid in foundation, 12,000, $24	288.00
Chimney, 40 lineal feet, $1.60	64.00
Cement floor, 800 square feet, 12c	96.00
Total excavating and masonry	$564.80

Figuring the Front Porch

2.08 squares 2x8 porch floor framing with fir flooring, $24	$49.92
2.08 squares of 2x4 porch ceiling framing with 5/8x3¼ face fir ceiling, $13	27.04
3 squares 2x4 porch roof framing with roof sheathing and shingles, $19	57.00
51 lineal feet porch cornice, 85c	43.25
48 lineal feet porch steps, 25c	12.00
3 porch columns, $6	18.00
25 lineal feet porch rail and balusters, 50c	12.50
25 square feet porch lattice panels, 40c	10.00
Total cost of porch above foundation	$229.71

The actual square feet of floor space is 208, which makes the porch figure approximately $1.105 per square foot.

Estimating the Main Building

5.44 squares 2x10 first floor framing with rough floor and plain red oak finish floor, $49	$538.56
3.28 squares 2x10 first floor framing with rough floor and 2¼ face clear yellow pine finish floor, $44	144.32
7.80 squares 2x8 second-story framing with rough floor and 2¼ face clear yellow pine finish floor, $42	327.60
8.72 squares 2x4 ceiling framing, $5.50	57.96
22.50 squares 2x4 outside wall framing with shiplap sheathing, $13	292.50
22.50 squares ½x4-inch siding, $9.50	213.75
13.25 squares 2x6 main roof framing with sheathing and shingles, $23	304.75
.50 square 2x4 bay window roof framing with sheathing and shingles, $23	11.50
1.80 squares 2x4 rear entry and porch roof framing with sheathing and shingles, $23	41.40
144 lineal feet outside base, 20c	28.80
112 lineal feet corner boards, 15c	16.80
128 lineal feet main cornice, 80c	102.40
20 lineal feet dormer cornice, 70c	14.00
38 lineal feet rear entry and porch cornice, 65c	24.70
18 lineal feet bay window cornice, 70c	12.60
2 squares 2x6 partition, $9	18.00
13 squares 2x4 partition, $7	91.00
4 cellar steps to grade line, $2	8.00
8 cellar steps, grade landing to cellar bottom, $1.25	10.00
24 square feet of landing, 60c	14.40
4 steps main stairs to landing, $3.50	14.00
9 steps landing to second floor, $3	27.00
24 square feet landing, 80c	19.20
6 cellar windows complete, 12x16 2 lt., $5	30.00
1 front window 40x40 & 40x16, oak finish	22.00
4 windows 24x28, 21 lts, oak finish, $18	72.00
2 single sash frames 30x20, oak finish, $13	26.00
1 twin sash frame 24x20, oak finish	24.00
1 frame 20x24, 2 lts, pine finish	12.00
1 twin frame 24x24, 2 lts, pine finish	28.00
7 frames 24x24, 2 lts, pine finish, $14	98.00
1 twin sash dormer window	12.00
1 outside door and frame oak finish, 3.0x7.0	47.00

1 mirror door 2.8x6.8, oak finish	50.00
2 French doors 2.0x6.8, oak finish	70.00
1 double acting door 2.8x6.8, oak finish	26.00
1 colonnade opening, oak finish	75.00
1 outside rear door, pine finish	20.00
1 grade door 2.8x6.0	20.00
1 inside cellar door 2.0x6.0	6.00
6 inside doors 2.8x6.8, pine finish, $18	108.00
4 inside doors 2.0x6.8, pine finish, $17.50	70.00
2 clothes chute doors 2.0x6.0, $16	32.00
142 feet oak base, 25c	35.50
170 feet oak picture mold, 12c	20.40
350 feet pine base, 15c	52.50
150 feet pine picture mold, 10c	15.00
Clothes chute	7.00
Cupboard case	30.00
Medicine cabinet	12.00
Closet shelves	8.00
Plastering 697 yards, 75c	522.75
Total	$3,884.30

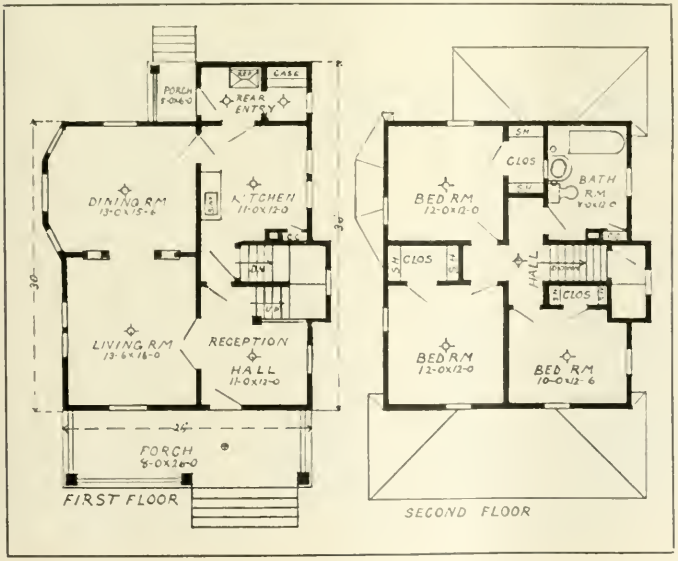
We find the cost of the lumber, millwork, carpenter labor, hardware and plastering to be $3,884.30. The square feet of floor space for both stories figures 1,652 feet. This figures approximately $2.35 per square foot of floor space. Now for a short cut in estimating we could figure as follows on a similar job:



Short-Cut Estimate

Here are figures for a short cut estimate worked on this basis. It is only necessary to figure out a constant price for this type of building.

Excavating, foundation and masonry	$564.80
208 square feet front porch, $1.105	229.84
1,652 square feet first and second floors, $2.35	3,882.20
Plumbing	450.00
Electric wiring	95.00
Gutter and tin work	70.00
Painting	225.00
Heating, furnace	300.00
Incidentals, 5% of the above	290.84
Total estimate	$6,107.68



THE following are figures just issued by the Department of Commerce, showing the percentage which the amount paid to each labor group bears to the total labor cost of a six-room house:

TOTAL LABOR COST 100%		
Trade	Frame house	Brick house
Carpenters	49.6	32.2
Bricklayers	6.2	21.5
Hod carriers	2.2	6.7
Plasterers	7.9	8.8
Plumbers	8.7	7.6
Electricians	2.6	2.5
Painters	10.0	6.3
Common laborers	6.3	9.9
All others	6.5	4.5
Total	100.0	100.0

These averages were constructed from reports covering a large number of six-room brick and frame houses throughout the country.

The relation of the amount paid to the various groups to the total labor cost varies according to the types of construction prevailing in the various localities; these are fair averages.



CARPENTRY

Good Practice in Frame Construction and Finish

Raising a Roof

How a Ticklish Repair Job was Successfully Undertaken

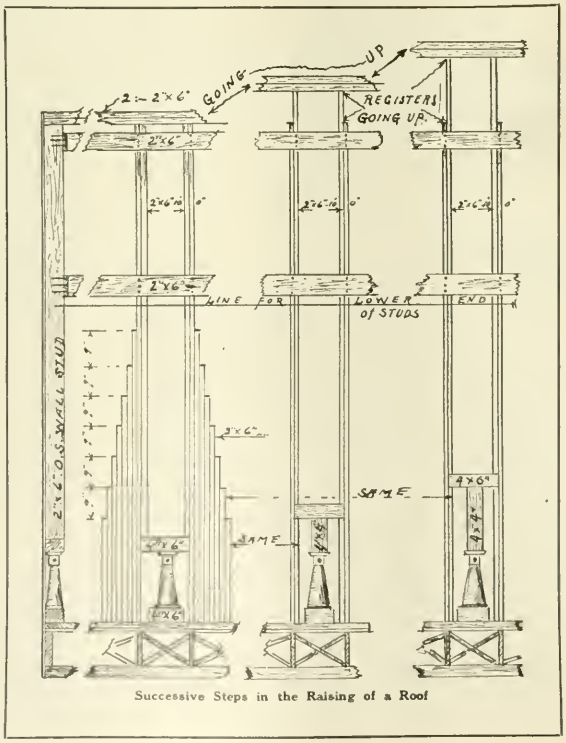
By C. A. DONER

IT is frequently desirable to raise the roof of a building intact but the difficulty of doing it often decides that the roof be taken apart or the job not done. Since few buildings can spare their roof long enough for new walls to be built and a new roof put over, the job isn't done.

Such a job went a-begging here last season for takers. The prospect was an armory, a frame structure 50'-0"x150'-0"x12'-0". Light frame wooden truss spanning the whole width and with a ceiling of ⅝" beaded stuff in fair shape. Side walls were covered with wall board, badly broken. Required: Raise roof to ceiling height of 18'-0", not forgetting what rain will do to a polished maple floor!

All walls were stripped of wall board and the 2"x6" studding made free of nails or other obstructions on both sides and inside edge. Splice studding was cut to uniform lengths of 10 feet, set in place and toenailed to plate, otherwise free to go up with plate and roof.

A line was drawn at the proper height along the permanent studs so when the lower ends of splice studs were raised to be even with this line, the ceiling would be the proper height and plate straight with the line.



Successive Steps in the Raising of a Roof

To prevent the roof and side walls from swaying sideways when the roof was lifted off the studs, 2"x6" timbers were spiked to permanent studs; this put the splice studs in a pocket in which they could slide up but not sway sideways. Further precautions for safety were provided in the way of ¾" manila lines.

When all material was cut and distributed and all jacks set, nine men with forty 16" jacks of 9" lifts had raised the roof and were spiking the splice studs into the permanent studs at the end of seven hours.

An outside scaffold being built in advance, the job was nicely inclosed from rain the second day.

Perhaps the accompanying drawings can best describe the remaining details and particulars.

When jacks had raised 9" the 4 x 6" blocks were supported by studs at that height, then jack was lowered and next height upright inserted and next raise made, etc.

WHAT'S NEW



New Materials and Equipment that Keep Your Work Up to Date



Fireproof Sheathing

FRAME buildings, as shown in our illustration, may be covered with a fire resisting material known as "Porete," this is manufactured in slab form of Portland cement and sand, reinforced with galvanized iron netting.

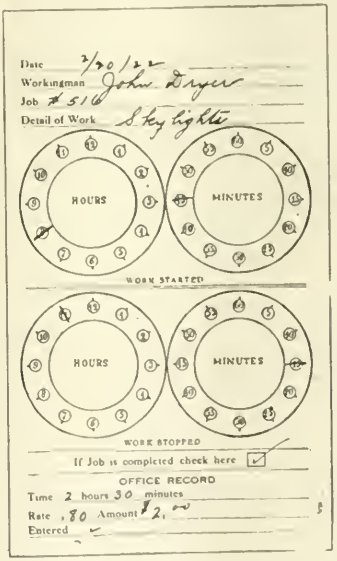
For stucco buildings they are economical to use as the ordinary wood sheathing and metal lath are not required; the stucco being applied directly to the slabs, and as they are practically slabs of re-inforced concrete, a perfect bond is assured.

Besides using the slab for sheathing the sides of a house they are also useful for covering roofs, both sloping and flat. Another economical use for the slabs is for closing the space underneath porches or the small house that is built only on piers.

These concrete slabs are manufactured by the Porete Mfg. Co., 26 Verona Ave., Newark, N. J.

Control of Labor Cost

THE control of labor time and cost are factors which require close attention. These factors may be "estimated" but cannot be pre-determined exactly. Still the final result in carrying through a job profitably depends to a large extent on labor



cost. Change of operating methods during progress of a job, or the change of workers, or the change of tools, or machines may be instrumental in turning a losing proposition into a profitable one. In order to accomplish this, the management should be constantly, correctly informed of the labor cost during progress of a job. This is accomplished by use of "Job Labor Tickets."

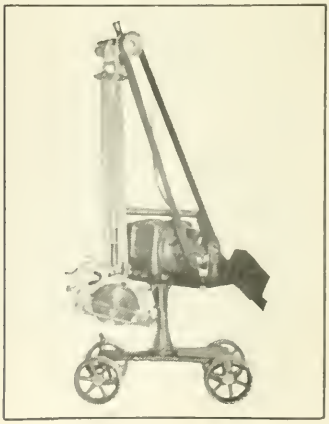
While there are many good job labor tickets in use, very few comply with all requirements.

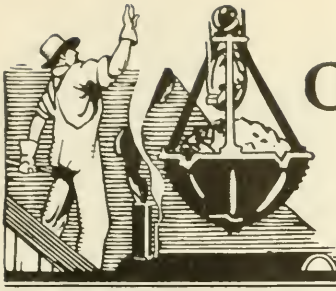
These "Clock-Face Time Tickets" are distributed by the Arrow Book Company of 347 Fifth Avenue, New York City, where free samples, prices, etc., may be obtained upon request.

Carpentering Machine

HERE is a small machine called "Flexway" that will effectively do practically all hand operations in woodworking. Stock up to 2 inches in thickness can be cut off, ripped, jointed, routed, grooved or bored, etc.

It is installed on a carpenters bench or may be used on the floor. On the bench it can be easily moved from end to end on tracks; for floor use, rubber tired wheels and a pull handle are supplied. Its extreme flexibility enables it to be used at any angle desired. Flexway is manufactured by the P. L. Billingsley Co., 427 Elm St., Cincinnati, O.





CONTRACTING EQUIPMENT

Reliable Information on Time and Labor Saving Devices

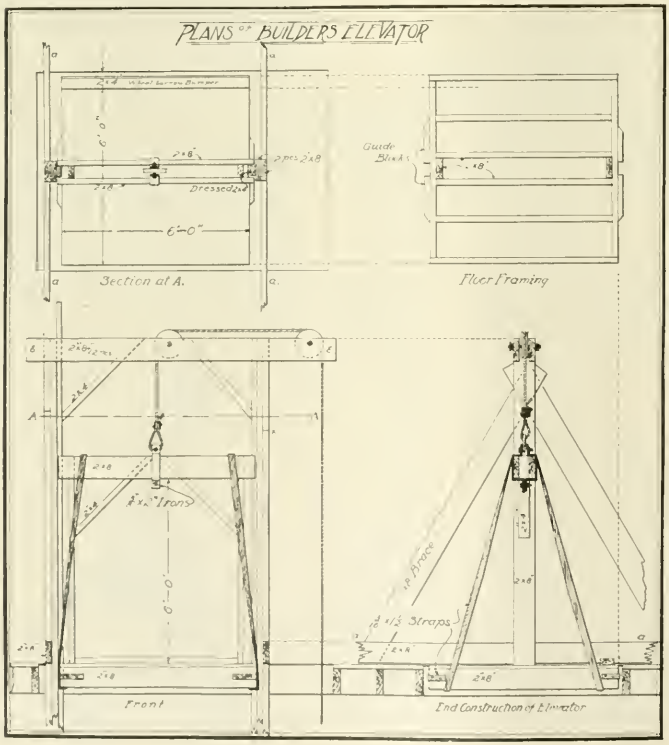
Construction Elevators

How to Design and Erect Elevators for Hoisting Building Materials

By LAWRENCE S KEIR

HOISTING building material on a job is economically and safely done by using a builder's elevator of simple construction like that shown here. The detail drawing given on this page represents the elevator as it would be set up inside the building under construction, using the future elevator well, the stair well or a temporary opening up through the building as a hoisting well.

The members *a a* rest on top of the floor or floor timbers at each story. They should be fastened securely and well braced. When the head piece *b b* is above the top floor special care should be taken to brace it. As will be seen the elevator is constructed of simple materials that can easily be secured at short notice.



Any size pulley wheels and rope may be used, provided they are strong enough for the work required of them, but better results will always be had with wheels of ample size; do not use pulleys less than eight inches in diameter.

The cars shown are six feet by six feet floor size which is a convenient size for two wheelbarrows side by side. Elevators of this kind may be erected singly or in pairs and so rigged as to run independently or they may be arranged to work together, one going down as the other is being hoisted up. The available hoisting power and the use to which the elevators are to be put determine this point.

The head piece is so arranged that it can be easily removed and the guide tracks spliced out from story to story as needed. A little forethought in splicing the two 2x8 pieces and the 2x4 piece that forms the guides will make it possible to have a long lap each time the guides are lengthened out.

The other drawings show how the elevators may be arranged either singly or doubly in a frame tower erected outside the building. These towers must be well braced and either



Heavy Steel Beam Being Moved in Position to Hoist in Outside Elevator Shaft

guyed or fastened to the building in some way

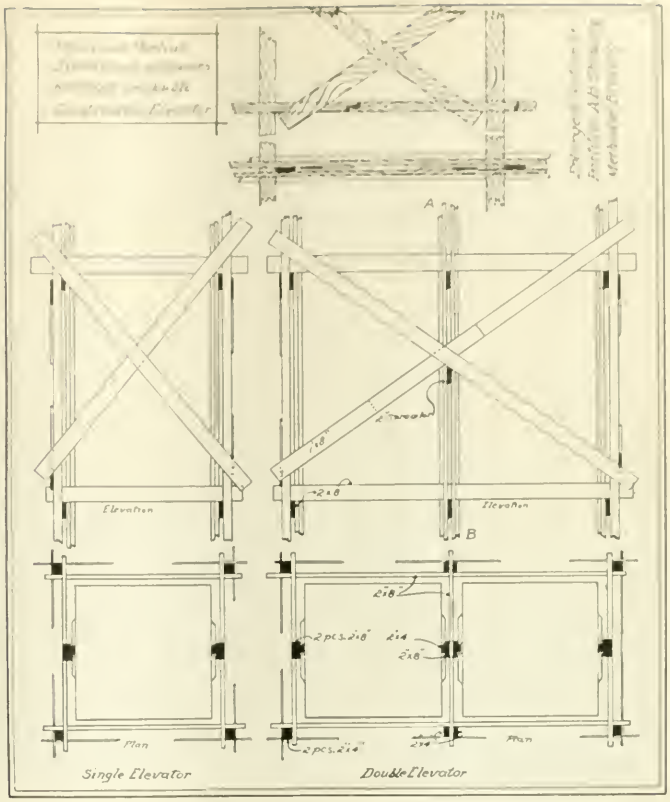
An elevator of this kind is sometimes used to hoist concrete to a raised platform from which the concrete is then dumped into chutes and deposited it where required.

The cars should be carefully made and the irons bolted on. They could be made during slack times, as they cost but little and are a good addition to the builder's equipment. Then when they are needed there will be no delay in getting them on the building job.

The towers and guides or tracks must necessarily be erected on the job and may be spiked or bolted together. In any case it is well to bolt the head piece into place as it is then easier to remove it to lengthen out the tracks. Sometimes the guides may be cut off so that the head piece, together with a length of each guide, can be hoisted as high as wanted and then the guides spliced out to the required height. This saves moving the head piece, which is worth considering if it should be spiked fast.

A reasonable amount of clearance between car and tracks, with straight smooth tracks, and plenty of grease make for smooth, easy running. Always provide ample platform space and good guard rails. Dry battery warning bells connecting elevator and hoisting engine are easily and cheaply installed. Don't let everybody and anybody use the elevators. Safety first and always should be one's slogan.

A good plan is to screen in the elevator shaft entirely to protect those "boobs," who can only find out where



the car is, by putting their heads into the shaft!

The two pictures show an interesting example of an outside elevator shaft which was erected for the raising of materials for an addition on top of the stage of the Metropolitan Opera House in New York.

This outside elevator shaft was used for the hoisting of some of the large steel beams necessary for the construction work. Ordinarily a derrick would be needed for this work.

The beams were slung and hoisted vertically through the shaft, then swung out at an angle so as to permit slipping the lower end of the girder through a window in the brick wall.

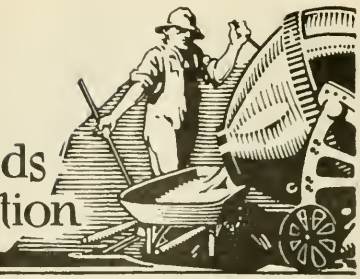
The operation of hoisting these beams caused a considerable amount of interest and a large crowd always gathered to watch the work. The contractor on this interesting alteration job was Perry Reed, of New York.



How the Steel Beam Was Successfully Raised to Top of Shaft Ready to Be Lowered Through Window

CONCRETE

Form Work-Reinforcing Methods Monolithic and Block Construction



Avoiding Concrete Failures

A Few Practical Points on Obtaining a Successful Sidewalk Job

By DALE VAN HORN

TODAY, with good cement on the market and its use past the experimental stage, what is to account for the large number of concrete sidewalk jobs which fail? Almost invariably, it can be traced to one or more of three or four things. If done in freezing weather there may have been lack of necessary precaution to guard against the damaging Jack Frost. Again, it might have been due to dirty aggregates, imperfect bonding, improperly constructed bases and foundations, or again the joints may have been hastily cut and failed to extend through all of the concrete. In other words, any one omission of several necessary steps in the construction of sidewalks will result in total or partial failure and eventual repair work. Good materials, proper methods carried out and careful workmanship are necessary qualifications for the construction of sound and lasting walks.

Aggregates selected should be inspected closely and only those presenting a hard and flinty surface should be used. The reason why pit sand and gravel fail to make good is because many of the particles have a fine coating of clay or dirt on their surfaces. This keeps the cement mortar from bonding with their surfaces and thus leave voids, later to become filled with water, and, when freezing weather approaches, the two split apart. Materials which show foreign matter clinging to them should be avoided, or thoroughly washed.

In the Middle West a common practice is to use sand and gravel entirely. These materials are all right for the top coat, but cement can be saved and a stronger bed obtained, if hard crushed rock is used in this step. Gravel or even sand does well for the top. It is to be understood that gravel is not to be omitted from the base, but that stone is to be used with it.

The foundation should be so constructed that it will not settle, but remain firmly rigid and at the same time offer a natural drainage for any water which might collect under it. In some localities, it is even necessary to provide artificial drainage where the soil is heavy and low. In this case, tile drainage lines are run at the outside of the walk to some natural outlet. Fills which have been improperly constructed and poor subbases are the cause of a lot of inferior walks.

One of the common results of a poor foundation is a crack which runs, often through the center of the walk for a considerable distance. This fact alone may not make it necessary to rebuild the walk. But weather changes, the action of freezing usually expand minute cracks to a width of an inch or more and the wider they become, the more chance the elements have to work. In time earth lodges there and soon a narrow ribbon of grass or weeds divide the walk. But worst of all, it will be only a matter of time until the whole will be in such a state that replacement becomes necessary.



Such Work Is Inexcusable Here—Had the Walk Been Located on a Less Pretentious Spot, the Poor Workmanship Might Have Been Accounted For—On a State Campus Within Stone's Throw of Fine Buildings, This Walk Keenly Reflects Against the Institution



Here the Cracks Have Started the Walk to Crumbling, and, Aided by Frost, Has Wrought Havoc With What Should Have Been a Lasting Job—Imperfect Bonding of the Surface and the Body and Unclean Materials, or Possibly a Poor Grade of Cement, Might Account For the Damage

In laying the walk the wood spreaders should be replaced every seventy-five feet or so with a thin metal strip of the same size or even a wood lath of one half inch thickness. When the walk has been finished, this strip is removed and the space filled with asphalt or tar, thus forming a natural expansion joint. Unless this precaution is taken there is imminent danger of heaving where two cakes are forced upward, due to the end pressure.

A wood float or wood trowel is the best tool with which to finish the top. The steel trowel is popular, but nevertheless, it leaves a surface easily made slippery and very often fine hairline cracks occur, not unlike incipient cracks. These fine cracks occur because the steel trowel leaves a film of pure cement which contracts upon hardening and drying.

If the top is to be laid after the base has hardened considerable care should be exercised in applying it. Water under pressure from a hose should be played on the surface until all free and foreign matter has been washed away. Then a creamy mixture of cement and water is applied and worked in. To this may then be applied the top.

Trees which are to be surrounded with concrete should be given at least six inches on all sides. The space within can be filled with sand.



100 Concrete Houses

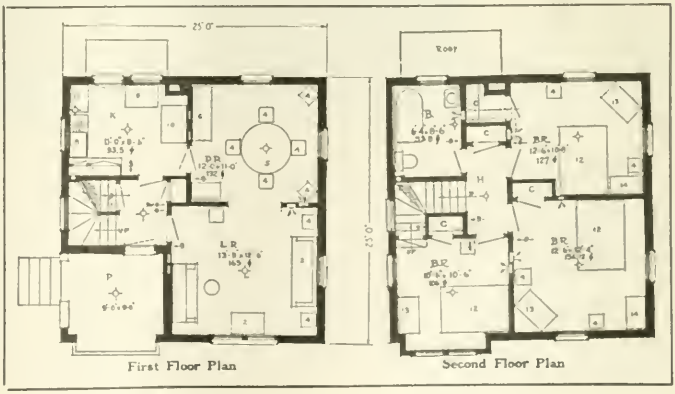
Interesting Housing Development at Johnstown, Pa of the Cambria Steel Co.

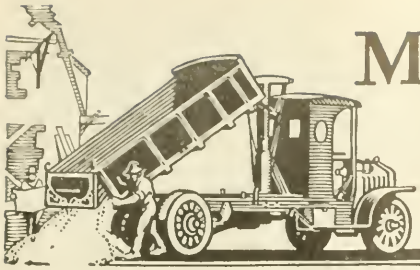
MODERATE cost houses of concrete are no innovation but when one hundred of them are built by one company it makes one stop and investigate the merits of the system used in their construction.

The houses vary in design, a number of plans having been worked out so that no two identical houses are located in the same vicinity. Various kinds of pebbles and shells have been used in the finish of the stucco, and the paint used on the trim is of various colors so as to give a pleasing color scheme.

Particular attention has been given to the room arrangement so that furniture will fit to the best advantage. The plans presented herewith are typical of all the houses, some however, have only five rooms.

These houses have hollow concrete walls made by using the Van Guilder double wall system, at a considerable saving over other forms of building.





MOTOR TRUCKS

Efficient Methods in their Use and Upkeep

Is Your Motor Truck Ready?

Little Things Examined and Repaired Now Will Ensure Service in the Busy Season

ALTHOUGH it is only March now it is well to remember that the sweltering days of summer will soon be with us and service stations will again be filled with heat-afflicted motor trucks. Will your truck be in the steaming-radiator line? Or is it prepared to give uninterrupted service during the summer, just when you need it on construction jobs?

Overheating and other common hot weather troubles are usually due to lack of forethought and to mistakes that can be easily avoided. The main points which require attention are briefly outlined below by A. F. Masury, Chief Engineer of the International Motor Co.

1—Do you understand the truck's cooling system thoroughly. If not, now is the time to go over it carefully and find out all there is to know about it. See that the flow of water is not impeded by any sort of obstruction and that the overflow pipe is not bent below the level of the base of the radiator filler. Be sure that the overflow pipe is not clogged or flattened.

2—Is the radiator clean? The front of the radiator should be free from dirt, license plates and signs. Also, the back of the radiator should be unobstructed so that nothing will impede the circulation of the air.

3—Are the hose connections water tight and is the hose in good condition? Be sure that the rubber has not been affected during the winter by an anti-freeze solution. Only the best quality rubber hose should be used, as the inside tubing of cheap hose is easily worn away and the rubber particles carried along with the water clog up the radiator.



Motor Trucks Deliver the Material on Time

4—Does the fan turn freely and is the belt tension right? The fan should be clean and its bearings should be well greased. A good test is to turn the fan by hand with the engine shut off. If it is possible to slip the belt easily, but not possible to spin the fan, the tension is right.

5—Is the carburetor choke in proper repair so that it opens all the way? Better open the seasonal shutter on the hot-air tube. Is the float level correct? If too high, slight flooding will cause an over-rich mixture.

6—Does the ignition system furnish a spark of sufficient strength? A weak spark due to excessive lubrication of the magneto, dirty breaker or distributor, or weak magnets, will have an affect similar to late spark timing and overheating will result.

7—Are the valve tappets properly adjusted? They should have from .008 to .010 inch clearance, which may be gauged by about the thickness of an ordinary post-card.

8—Are the cylinders free from carbon? If not, remove it.

9—Is the oil in the crankcase clean? Gasoline, dirt, or other foreign substances will impair the quality of the oil in the crankcase resulting in overheated parts due to insufficient lubrication. The oil reservoir should be drained every 1,500 miles, the walls thoroughly cleaned, and a fresh supply of oil should then be put into the crankcase.

10—Are you using the right grade of oil? Because of the increased temperatures it is often advisable in summer to use a heavy grade of oil.

11—Are the exhaust pipe and muffler clean?

MASONRY
Practical Information on Materials and Latest Construction Methods



Garden Walks

How to Lay a Stone Path for Beauty and Service

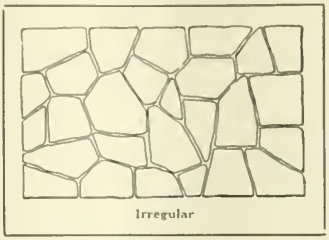
By H. ROGERS

STONE for paths and terraces is growing in favor with quite a number of home owners and therefore the builder is often called upon to construct such a walk and to aid him in this work the following remarks may be appreciated:

To make a good job the walk should have a proper foundation; a trench eight inches or more in depth should be made and filled in with some refuse material that will allow of quick drainage, broken stone or cinders are good but, if the building has just been completed, there will be more or less broken pieces of brick and stone lying around for removal; these can be buried for the path foundations at a saving at both ends, it gets rid of the rubbish and no material has to be purchased.

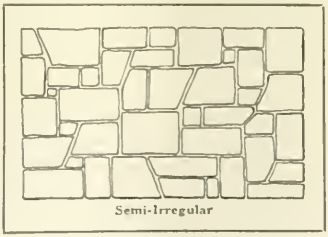
A stretched cord is the best means of keeping the lines of the path straight; for curved paths the radius is described with a cord fastened to a stake as a center.

If the garden is level it is best to give the path a slight camber to throw off the rain water but this is unnecessary if the ground slopes perceptibly across the line of the path, as then the path may be kept flat on the surface and made to continue the natural slope of the ground. To get the path level one should use a large straightedge; this is preferable to a cord which is likely to sag.



Irregular

Little did England's old gardeners and our own Colonial forebears appreciate the beauty of their winding grass framed walks, made of stepping stones. There is a delightful absence of artificialness about such a path and that is the reason, perhaps, why they are being better appreciated by the people of today.



Semi-Irregular

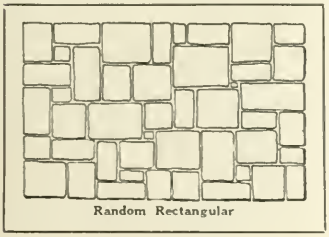
In localities where stone abounds the cost is but little for material. In other places it pays to buy the stone and have it shipped so as to get the delightful effects. Slate is now being used for this purpose to quite an extent.

The stones should be worked into more or less regular shapes, no sharp angles being allowed and when laid their edges should not be in close contact, the spaces between are filled with cement mortar or, where preferred, dirt in which the grass is allowed to grow. Today the very grass which our ancestors railed about for growing between the random stone-laid terraces and paths is highly appreciated.

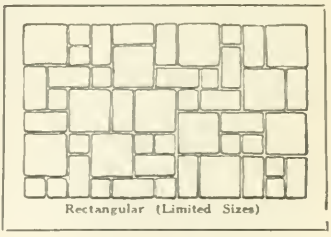
Where the stones can be had of nearly equal thickness throughout—as is the case where blue stone or slate is used—they may be simply laid flat upon the foundation and grouted with liquid cement. Where the stones vary much in thickness it is better to build them together like rubble work.

Whenever possible secure stones of different colors for the same piece of work as when rightfully handled a very artistic mosaic-like result can be obtained.

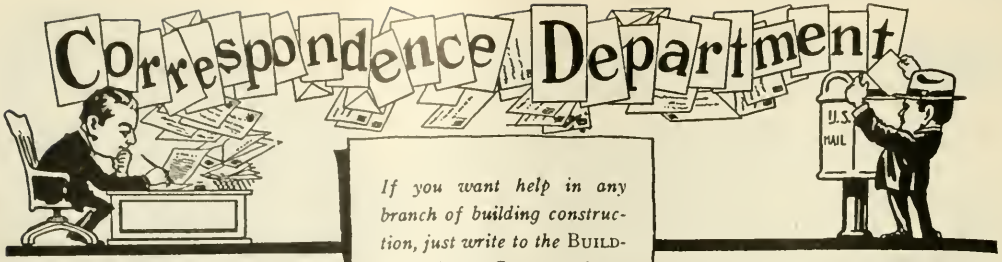
The illustrations on this page will give a few ideas of how the stones may be laid to obtain good effects. To obtain the best results scatter the colors about, avoiding a set design in colors.



Random Rectangular



Rectangular (Limited Sizes)



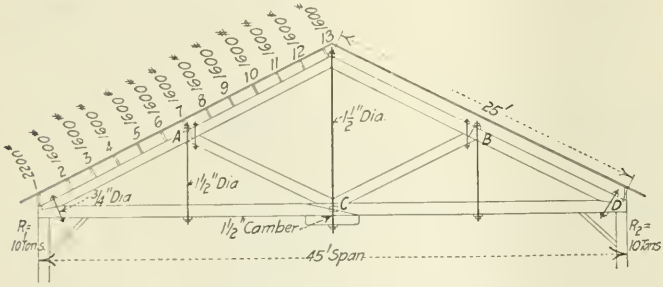
If you want help in any branch of building construction, just write to the BUILDING AGE *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Novel Truss Design

HERE is a sketch of a roof truss that I designed and built over five years ago. The truss is still in the same condition today as when I left it. The camber has not deflected in the chord ¼ of an inch. The building was erected for a factory and the idea was to use only short lengths of yellow pine timbers. The building was 190 feet long with a span of 45 feet.

As the enlarged section shows, the rafter was cut in two pieces and gained into the strut and secured by a bolt with additional pieces of timber nailed over the outsides.



The principal dimensions were as follows:

8 x 10 inch chord.
8 x 10 inch rafters.
8 x 10 inch struts.
8 x 10 inch purlins.

In calculating the stresses a dead and live load of 50 pounds per square foot was allowed for. The trusses are spaced 16 feet from center to center. The purlins are covered with one inch sheathing and these are covered with 3 ply roofing. In the enlarged section it will be noticed that the thrust of C B equals the thrust of B D. The thrust of E B is transmitted to D.

A reaction of ten tons has been figured on the walls for each side of the truss. The pitch was one-quarter.

The following formula was used in all the calculations:

Base multiplied by depth squared, multiplied by 100 divided by span in feet equals safe load.

On account of the truss being made up of short pieces, the cost is not as great and time can be saved in raising the truss.

I was carpenter foreman when I designed it and I trust it will be of interest and help to my fellow readers.—Wm. H. Malseed.

HAVE you ever used any machinery or device which has saved you time and money? Have you ever invented any way of doing a piece of work quicker? If you have BUILDING AGE wants your experience, and will pay regular space rate for it.

Your description should tell just how you saved time and money, either by a special way of using machinery or by short cuts in construction. Point out what methods you were using before adopting your "Time Saver" and show how your new method turns the trick. You can submit as many articles as you want.

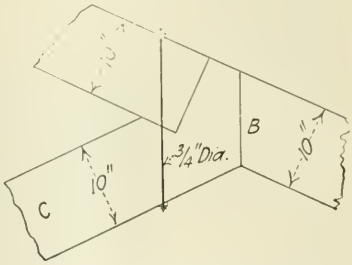
Address The Editor, BUILDING AGE, 920 Broadway, New York City.

How to Construct a Good Chimney

KINDLY tell me how to construct a good chimney that will draw well.—E. K. L., Seattle, Wash.

Information and data on chimney construction may be obtained from the various brick associations and also from the National Board of Fire Underwriters. The points to be observed are briefly discussed as follows:

In planning chimneys the points to be considered are the number and size, the height and the arrangement of the flues. Attention must also be given to the location in respect to valleys on the roof, the immediate neighborhood of walls, hills or trees, as these factors tend to create at times strong eddies and cross currents which interfere with the draft.



In order to make the chimney draw properly a separate flue should be provided for each fireplace, the flue to extend to the top of the chimney.

For ordinary stoves and small furnaces the flues may be 8 x 8 in. in cross section, but if the furnace is large it is better to have a flue 8 x 12 in. and the same size should be used when possible for fireplaces having large grates.

If slight bends occur in the construction the cross sectional area at these parts should be the same as in the straight part and be made round in shape as this shape eliminates the frictional resistance more than a square flue.

If a room is kept practically air tight by using weather strips on the doors

and other draft preventives the chimney is liable to smoke; also when there are two chimneys one higher than the other in adjacent rooms and the doors and windows are closed in the house the draft in the shorter chimney will come down into the room to supply an upward draft in the higher chimney.

Flues should also be lined with some fireproof material and the building laws in many large cities require this to be done.

Tile flue lining makes a decidedly efficient tight chimney and absorbs less heat than a brick chimney. Sometimes galvanized iron pipe is used, and if the pipe is round the space between it and the walls of the chimney may be utilized for ventilation.

If flue linings are not used the outer walls of the chimney flues should be 8 in. thick.

Chimneys should be constructed of the best hard brick and cement mortar and all joints should be properly filled.

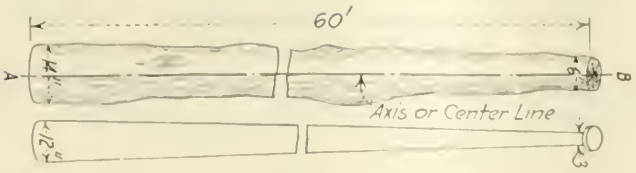
A chimney should be kept well cleaned for the reason that a sooty chimney not only interferes with the draft but also tends to cause lightning to strike it.

In order to prevent a downpour of rain from entering the chimney and smothering the fire, the top of the chimney is frequently covered with a stone slab or cap, the smoke passing out through openings at the sides near the top.

Shaping Taper Posts and Poles

IN order to properly shape a taper pole or post from a tree, peel off the bark with a draw knife or broad chisel, then find, on the top and bottom ends, the center of the ends, which we will assume are sawed about square to the axis line A B, which is struck with a chalk line stretched, as indicated in the cut from a diameter marked across each end. There should be two of these square to each other so as to form a cross.

Hew off each side to the outline desired either straight or curved, hewing each side straight and square to the right or in other words "square the pole." Next take it of octagonal or eight-sided section and finally round. All this may be done with the adze, hatchet and draw knife, using the eyes for judging outline and shape. Finally use the jack plane and smoother for a smooth finish, taking off all ridges to obtain a round, even, regular surface.



All this takes time and patience. The tree or the pole should rest on four or more horses at a good convenient height for planing, etc., and be turned with cant hooks at the bottom end, which is to go into the ground or concrete.

Flag or clothes poles are generally set one-tenth of the length in the ground and it is best to have their bottom covered ends coated with creosote or tar before embedded in concrete which is filled into the holes after they are erected and plumbed, which is best done by sighting them with an adjacent plumb object such as the outer angle or corner of a building. Of course a plumb bob and line held high up on the stick may be employed to verify the setting.—**Owen B. Maginnis.**

The Quality Roof Scaffold

HOW often in the past has the contractor been called upon to either renew, repaint or re-top a chimney, where the discouraging part of the whole business has been the item of erecting a scaffold, whereby the mason might have the necessary foot room for the successful completion of the work.

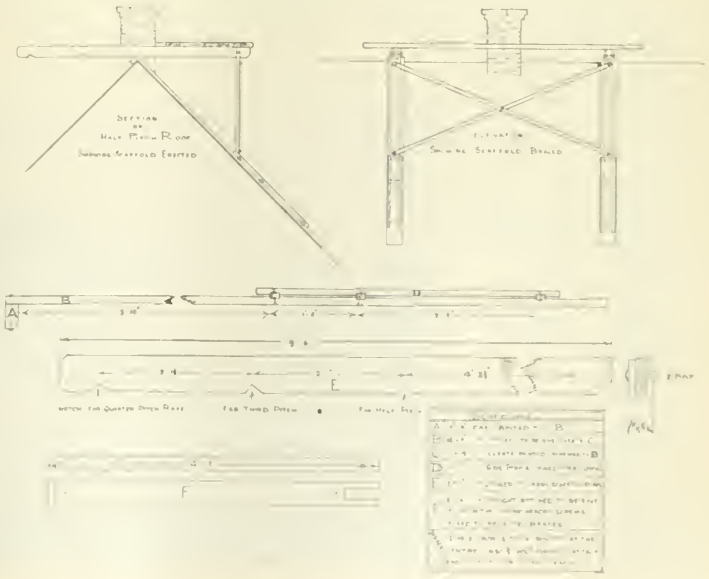
There is also the hazardous nature of the work, connected with the erection of such a scaffold, which requires skilled labor, but this is not always available when most needed, thus making the scaffold item of expense sometimes more than the cost of the chimney repair itself.

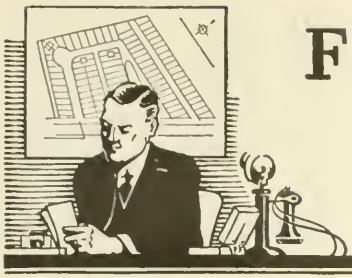
This is the time of the year when many building contractors throughout the northern states have the time to consider any labor-saving device that will help them in their business.

Now the "Utility Roof Scaffold," as I call it, is described herewith by sketches and details that are self-explanatory. It can be made by any shop or mill carpenter (with the exception of the iron brace) and in one season will probably pay for itself many times over.

If given two coats of paint and a place is made for the different members when not in use, it will last for years.

It is a device that I designed and made, while I was shop foreman for a contracting firm of this city, who found it both practical and economical, doing away entirely with the carpenter labor, that is always necessary, and substituting unskilled labor.—**Joshua Thompson.**





FINANCE and REAL ESTATE

Helpful Data for the Builder Who Builds to Sell

Financing Home Construction

Interesting Methods Used to Promote Home Building in the South

WRITING to the editor, Robert Jemison, Jr., President of Jemison and Co., investment bankers, of Birmingham, Ala., says:

"As one of your subscribers, it occurred to us that you might be interested in our new office building, which we believe to be more or less unique and distinctive and it is perhaps one of the largest and best equipped buildings in the country occupied exclusively by firms engaged in the business of real estate, insurance and mortgage loans."

This building is a reflection of the sound conditions of the building and real estate interests in the South at the present time.

TO MORTGAGE BANKERS AND TRUST COMPANIES:
"We and you have a responsibility to fulfill to the people who need help to house themselves."—Walter Stabler, Comptroller, Metropolitan Life Insurance Company.

With the past year surpassing 1920 by more than $2,000,000 in the cost of building construction, Birmingham is starting the year 1922 with splendid prospects of eclipsing that and all former records.

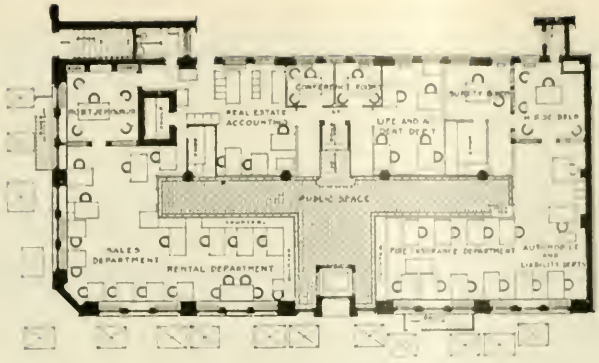
This applies alike to residential, business and municipal construction. Municipal authorities announce that the year will witness the construction of an auditorium to seat from 7,500 to 10,000 people, for which bonds have been voted, and that construction of a new city hall, market and library is also contemplated for the year. These four structures may be combined in one building to cover an entire city block, if plans now considered are finally adopted, the cost of the construction to reach about $2,000,000.

County authorities are also contemplating a new court house to cost upwards of $1,000,000. Numerous business blocks are being planned, and the outlook is that the 1921 record of residences, when more than 5,000 were constructed, will be distanced. Birmingham early in 1921 began showing sister southern cities that it is a real home loving and home building city.



"With the beginning of the new year one building and loan association here found it necessary to increase its stock by $1,000,000, following an increase of $2,000,000 during last year. All this capital is invested in Birmingham buildings. The real estate firm of Jemison & Company, one of the largest in the South, assisted largely in the building program of the city, making loans of over $2,000,000 on Birmingham residential property and Alabama farms during the year for the Metropolitan Life Insurance Company, the mortgage department of which they represent in Alabama as state agents. The Jemison Company are preparing for a more active year in 1922 than it enjoyed in 1921 and is offering a very attractive plan for making fifteen-year loans on an easy payment plan on new homes and apartments, projected by the Metropolitan Life Insurance Company.

"We are very fortunate in representing the Metropolitan Life Insurance Company when there is such strong demand in Alabama for money with which to build homes and improve farms.



Ground Floor Plan

This connection enables us to make fifteen-year loans on homes on a successful easy payment plan, and we have been able to assist many persons of limited means to own their homes and obtain relief from the rental burden. We have also encouraged the construction of apartment houses and the erection of numerous needed business blocks. As our easy payment plan is better known it will become more popular and we expect a large increased business for the present year over the past."

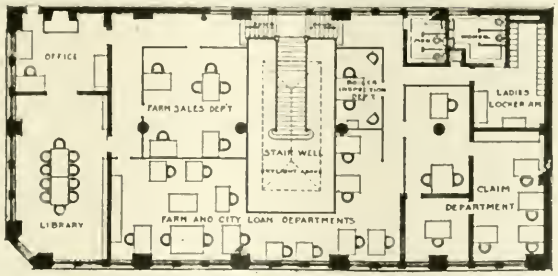
The optimism is also reflected through other real estate and building material firms of the city. The new year started with many of the large iron and steel industries of the city and district resuming operations, and these resumptions have naturally made the building outlook loom brighter for the year to come.

The essential points of the Metropolitan Life Insurance Company's loan plan are as follows:

Loans are made up to one-half the value of the property. Thus a house costing $5,000, built on property worth $1,000, the maximum amount of the loan would be $3,000.

Payments on the loan are made semi-annually, the interest is at the rate of 6½%, the payment on the loan is 3% of the principal plus the interest semi-annually. At this rate the term of the loan is for fifteen years, this brings down the average cost to the borrower to $8.60 per month per $1,000.

In connection with this statement of Mr. Jemison's we present herewith a description of the new commercial building of Jemison & Company. The plans show the arrangement of the office. Each desk has been located with a view of the work to be done and it will serve as a model in planning office layout which is a problem frequently put up to builders and architects.



Second Floor Plan

The building as it stands today consists of two stories and a basement, but the foundations are adequate for a structure of ten stories, an assurance that they will keep pace with the growth of Birmingham.

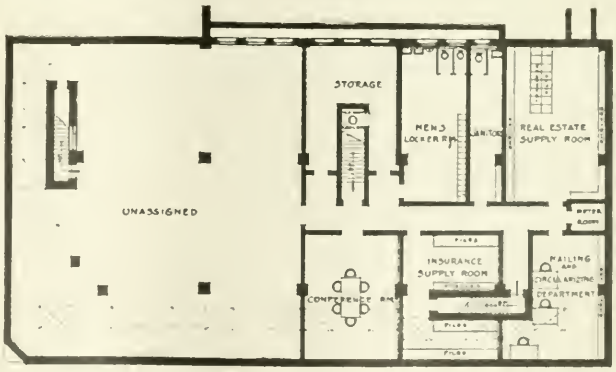
It stands on a lot 50x100, one of the most prominent corners of Birmingham. Messrs. Warren & Knight of Birmingham were the architects.

The construction is reinforced concrete. The exterior is Indiana limestone; the interior is caen stone, Tennessee marble and mahogany. The furniture and fixtures are in harmony with the dignity of their environment.

A "thing of beauty is a joy forever," in the business world as in the domain of art.

In designing the building particular attention was paid to arranging the space for the different employees so that their work in connection with other departments could be most conveniently done.

From the vestibule one enters the public space which has a block marble floor. Directly ahead is the staircase to the second floor which is of marble supported on cast iron stringers. The hand rails are of polished brass supported on ornamental balusters; this rail continues all around the large open well on the second floor. This well practically makes the second floor a mezzanine to the first floor, and the office is in one unit instead of being scattered on two floors, a very desirable feature.



Basement Plan



PAINTING

Practical Points of Interest to the Builder

The Shingle Roof

By A. ASHMUN KELLY

IS the good old shingle roof doomed? Are the imitation shingles taking the place of the real wooden shingles? To a large extent this is just what is happening. Gradually the various widely advertised asphalt and metal shingles are superseding the cedar and redwood shingles. It is a large subject, and cannot be covered in a restricted magazine article. But it may be that a few words on the subject will interest those who have to do with roofs and roofing materials.

Wooden roofs have the disadvantage of not being fireproof. But they can easily and cheaply be made so. Any coating or stain that will prevent combustion from a cinder or small spark long enough to prevent a flame will do. Even so simple a thing as lime water will do. But the best way is to dip in a good stain, for this will not only render the wood fireproof, but it will also prevent rot, and extend the life of the roof many years.

Creosote stain is the ideal one for shingles. And the shingles should be dipt two-thirds their length. This insures a perfect coating for all parts that will be exposed. Then a brush coat of the stain after the shingles are laid will be a great help, though it is not essential to effective work.

Creosote stain makes it rather costly shingling. But it will pay the client who has it done. One gallon will give two coats of stain to 100 square feet of shingles. When dipt two-thirds their length, 2½ to 3 gallons of stain will coat one thousand 4x16-inch shingles.

Shingles should be perfectly dry before staining, but I have had perfectly good results where I have dip-stained shingles that were not dry, and where I had to throw them into a pile with some rain falling; and placed on the roof before the stain was dry. But this is not advised if it can be avoided. The idea is, that when the shingle is dry it will take up more stain. As the stain is oily the water does not have any effect, unless under the stain. That is why the wood should be dry.

A HIGH-GRADE creosote stain may be cheapened by adding three gallons of water-white 150 deg. test oil, and one gallon of Japan drier to each three gallons of creosote liquid. Crude oil, and the other petroleum or mineral oils do not unite readily with creosote oil, although such liquids are used for the purpose of doping creosote stain. Such doping is not advised as it ruins the creosote as a stain, but painters do sometimes resort to the practise instead of getting a better price for their work. And when it is necessary to thin out creosote stain it is better to use raw linseed oil for shingles, and turpentine for inside staining. Such thinning is not often needed as the stain is right when bought, though by not keeping it well stirred while dipping the heavier part will settle and then will require thinning to reduce it.

Creosote burns the flesh, that you of course know; better rub the hands and wrist and maybe the face with linseed oil before beginning. If the stain does get on hands or face, don't try to rub it off, but apply linseed oil, after which you can rub the part off. Rubbing it while the fresh creosote is on the flesh will only spread it the more. Do not wash it off, for that will simply separate the tar acids and burn you the worse; creosote contains about 10 per cent. of this acid.

Creosote stain will get rather thick in cold weather, which is owing to the small quantity of naphthaline that it contains. When in this condition heat it a little, or put it in a warm place for a time.

Ordinary oil paint is not thought to be good for shingle roofs, but by using a very thin oil paint stain, and dipping the shingles very satisfactory results may be obtained. Or the shingles may be done after laying, same as with creosote. The paint stain should be made from the best pigments. They should be finely ground in raw linseed oil, at the mill of course, and creosote may be stained too with such colors; in fact that is the way the colored creosote stains are produced. Only that the creosote will of course alter the tone of the pigment stain. Yet they will give very nice shades of color.

Raw and burnt sienna and raw and burnt umber are two fine pigments for stains, especially for the creosote stains. But the only green pigment that can be used is the chemically pure, not the green that is made by mixing yellow and blue together. This applies also to the reds, except the oxide reds. They should be chemically pure colors, without any aniline in them. This for permanency, as aniline colors will soon fade in the sun.



Barn Design of Hollow Tile

THERE are many advantages in having a barn built of other material than wood. A hollow tile barn such as we illustrate here is much warmer than a frame structure, which we too often find with wide cracks in the sheathing, affording but little real protection from the outside cold.

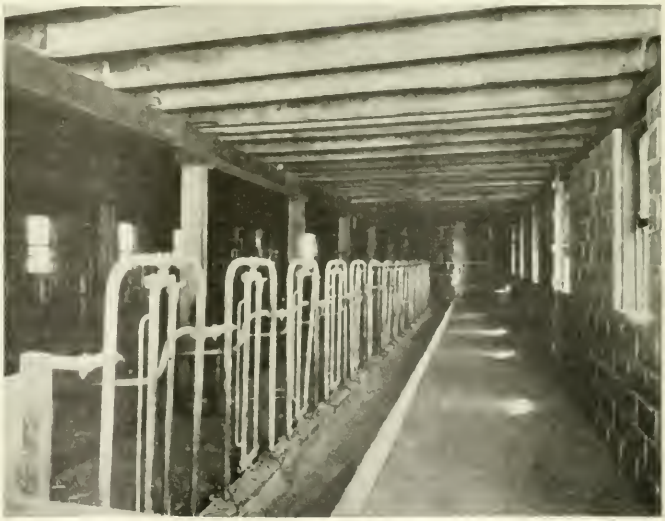
The interesting barn shown here has been built of hollow tile with a vitrified face, it being unnecessary to coat this with stucco. In the construction of a barn such as this, concrete footings are first laid and then the foundation can be made of hollow tile and filled with concrete up to grade, this is frequently omitted; the corners, however, should be filled solid and it is a good plan to put reinforcing rods in the corner blocks.

The interior floors, gutter and trough are of concrete throughout. Note the arrangement of the stalls on the interior view shown below. The feeding can be conveniently done from this alley. Through the center the stalls can be easily cleaned, and milking performed. All of these are equipped with metal stanchions. The silos are built of hollow tile. They are 34 feet high and have a capacity of 80 tons; as shown in the picture, access to the silo is obtained directly from the barn through a door at the bottom of the chute, making a convenient feeding arrangement and eliminating the necessity of the farmer exposing himself in cold or rainy weather to get at this silage.

The barn has an excellent system of ventilation, with pipes well distributed throughout and ending in ventilators on the roof of the building. With well drained floors a barn of this sort will always be dry. The difficulty with most masonry farm buildings is that they are apt to be damp, due to the condensation of moisture from the warmer inside air on the walls. This objection is eliminated by the hollow walls used in the construction of these buildings. The insulating properties of this air space prevents the condensation of moisture on the interior walls by keeping this at the same temperature as the interior of the barn.

A barn arranged in this manner is easily kept sanitary, as it can be kept clean with the least possible labor. An adequate water supply enables the walls to be flushed whenever necessary. There are no parts about the barn or walls to rot, and this means for sanitation.

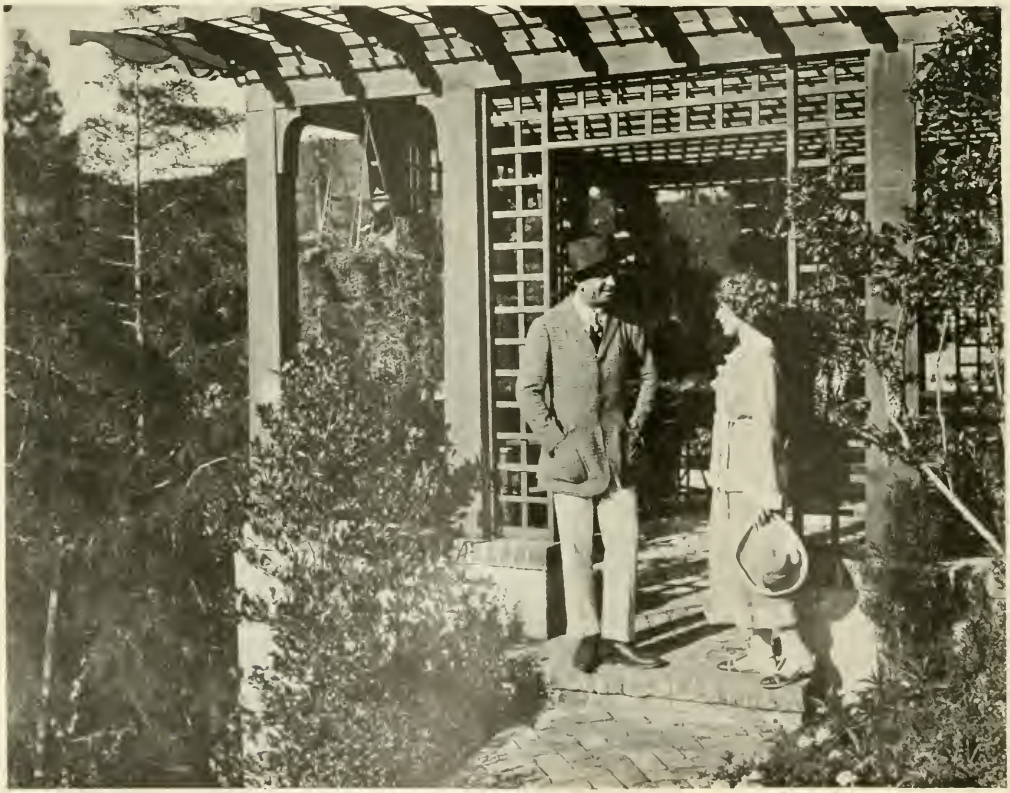
A fireproof barn that stores hay is out of the question but to diminish the damage from fire many barns are now being erected with the haymow floor of concrete laid on expanded metal lath which is carried on metal lumber beams which are in turn supported by iron posts.







PERGOLAS add greatly to the beauty of home grounds. When the house is finished there are different ways of enhancing its attractiveness and builders who recommend these ideas will surely obtain the extra work. The few designs shown here are good suggestions of what can be accomplished at but small expense to secure pleasing results.



What the Editor Thinks

Are Building Departments to Blame?

BOTH the Brooklyn, N. Y., and Washington, D. C., collapse of theatre roofs has raised the subject of responsibility in the respective Building Departments.

In each case it was shown that the erection was in violation of approved plans, which seems to absolve the Building Department officials *but* they permitted these structures to exist. They were either negligent or powerless to order the necessary changes which the plan examiner had advised.

Are Building Departments to be considered a joke? True, too often, the action and interpretation of the regulations by Department officials is so absurd as to disgust architects and builders.

Chafing at the delay in passing simple plans, many architects and builders have gone ahead with construction before the plans are approved.

This method is fundamentally wrong. No construction work should be started until plans are approved and then these should be followed.

The object of a building code is protection of the public and to this end, the whole-hearted co-operation of all men involved ought to be given.

The men who comprise the staff of building departments are only human, it is a physical impossibility for them to pass plans promptly at certain seasons of the year when there is a rush, still delays incident to this are very expensive to the contractor.

Would it not be wise to divide the small and large jobs, examining small ones quickly instead of running in numerical order? This numerical method ties up a small job for an unreasonable length of time, if preceded by plans for several large operations.

Inspectors are often bulldozed into passing construction they know is at variance with the approved plans. Many inspectors have heard the remark, "Well its up, what are you going to do about it?" Sometimes the mysterious $$$ high sign is given and the job is O. K!

Every contractor and architect who prepares plans that will have to be approved knows or should know the requirements of the code. Why not live up to the code? Is it the right thing to try and slip something over on the plan examiner, taking a chance that he might not see it? Let us all be square with our building department and then we can insist on their being fair with us.

It is to be hoped that a reasonable National Building Code will come about, then it should receive honest support, as well as honest enforcement.

Improving Construction Methods

NEW methods of construction that will cut down the cost of building should receive earnest consideration.

In all lines of industry the human family are wont to look upon innovations with a sort of suspicion. We go along in the line of least resistance and naturally fall in the habit of using the same paths our ancestors trod.

All of our readers may not approve of the innovations devised by Ernest Flagg which are described on another page but here is a step, or rather several steps, off the beaten path.

If more members of the building industry would give the subject thought in the same way Mr. Flagg has, many new methods of construction would be evolved for lessening cost and increasing conveniences as well as appearance in our homes and other buildings.

We think that the building industry is indebted to Mr. Flagg for the creative work that he has undertaken, to do something definitely helpful.

Apprentices for Building Trades

QUITE a problem faces building contractors of the country, and this is the probability of not securing enough skilled mechanics to carry on the work. When there is plenty of work and comparatively few mechanics, bonuses are in order and we find one contractor bidding against another for help.

The solution of this problem is the recruiting of apprentices for various trades connected with the building industries. But to do this it is up to the contractors to make working conditions more attractive to apprentices.

We must remember that they are the journeymen of tomorrow, they should not be treated as just mere errand or water boys. Unless steps are taken to properly train the youngsters now who is going to lay bricks or do the carpentry or painting in years to come?

Now there are plenty of serious minded young men who are ambitious and they should be encouraged.

One big objection to most building trades is the lack of steady work, now why cannot a bricklayer or roofer also be a painter, electrician or other inside worker? There is nothing hard in learning two or more trades. Teach the kids to be a little more self reliant and show them that there are plenty of good openings in the building game for real workers, and, with fair wages, the work should appeal.

Remodeling Jobs Are Profitable

THERE are many old style large residences in every city that are more or less white elephants to their owners. They are unable to keep them up and cannot sell them except at a great sacrifice. Here is a chance for the progressive builder to get busy and submit a tangible plan to the owner of such a building, showing him how to alter it into stores, apartments, or offices, so that there will be an income from the property.

Review of Building Situation

CONSTRUCTION activity in January, according to figures published by the F. W. Dodge Co., show that the total of contracts awarded (not contemplated) amounted to $166,320,200. This is 16% less than the amount of contracts awarded in December, 1921, but it is 49% greater than January, 1921. This shows very conclusively that the volume of business this year is going to be a big improvement over 1921, and that was considered good.

Residential building still keeps in the lead as 45% of the total is for this class of construction, amounting to $75,728,000. Of this amount $53,269,200, is to be spent in the Eastern States this certainly is a very remarkable showing as it indicates the need of homes in the East is more acute than in the West and South. In the far West, Southern California still remains very active.

In the Northwest district the January figures are 64% less than that for December and 33% less than the total for January, 1921. In the Central West district conditions are much better, the amount of contracts being only 7% less than in December but 19% greater than January, 1921, this is a very healthy sign.

In the Middle Atlantic district there was a decrease of 24% from December figures but a 73% increase over January, 1921. Contemplated new work is 22% over the volume for December.

In the New England district the contracts awarded show a 40% decline from the December figures but it is nearly double that of January, 1921! The figure for contemplated work shows an increase of 40% over that reported for December.

The most activity is disclosed in the New York district, here, although there was a decrease of 13% over December figures, the amount of contracts awarded in January were two and a half times the amount of January, 1921! $35,330,000 or 65% of the total amount of contracts awarded in January is to be spent for residence construction alone.

THE Building Trades Employers' Association of New York City recently made a survey of the employment situation in the building trades throughout the country.

Among other interesting data it gives a list of the building trades in the order, as one might say, of their scarcity. Showing the plasterers in greater demand than any other trade and putting concrete laborers, the supply of whom greatly exceeds the demand, at the bottom of the list with the other trades in between in the following order: 1, Plasterers; 2, Terrazzo Workers; 3, Encaustic Tile Layers; 4, Elevator Constructors; 5, Marble Cutters and Setters; 6, Metallic Lathers; 7, Bricklayers; 8, Painters; 9, Steamfitters; 10, Mosaic Workers; 11, Plumbers; 12, Carpenters; 13, Plasterers' Helpers; 14, Sheetmetal Workers; 15, Cement Finishers; 16, Tar and Felt Roofers; 17, Hod Carriers; 18, Structural Iron Workers; 19, Hoisting Engineers; 20, Electrical Workers and 21, Cement and Concrete Laborers.

Record of January, 1922, Contracts Awarded

Classification of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business Buildings	$3,137,100	$6,419,800	$2,698,600	$2,697,400	$8,599,200	$143,800	$23,695,900
Educational Buildings	1,307,000	2,063,600	2,204,900	1,496,300	4,133,500	862,000	12,067,300
Hospitals and Institutions	910,000	1,597,700	443,000	1,146,000	1,272,000	.....	5,368,700
Industrial Buildings	3,282,900	4,724,300	2,055,000	5,203,500	4,424,100	5,500	19,695,300
Military and Naval Buildings	.....	.....	140,400	35,000	40,000	150,000	365,400
Public Buildings	20,000	373,000	148,000	55,900	295,400	49,500	941,800
Public Works and Public Utilities	1,285,300	2,077,000	2,303,600	4,973,100	7,422,300	673,600	18,734,900
Religious and Memorial Buildings	167,000	409,800	359,500	670,600	1,686,000	74,000	3,366,900
Residential Buildings	5,090,100	35,329,700	12,849,400	7,966,500	13,558,300	934,300	75,728,300
Social and Recreational Buildings	805,500	1,265,500	1,034,300	1,722,000	1,363,400	165,000	6,355,700
Total	$16,004,900	$54,260,400	$24,236,700	$25,966,300	$42,794,200	$3,057,700	$166,320,200

Building Projects Contemplated January, 1922

Classification of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business Buildings	$10,652,600	$16,628,000	$5,895,900	$11,649,600	$39,725,300	$1,540,300	$86,091,700
Educational Buildings	7,671,000	7,252,100	6,350,300	2,095,000	18,829,500	461,000	42,658,900
Hospitals and Institutions	823,000	3,627,000	1,201,000	377,900	4,078,000	290,000	10,396,900
Industrial Buildings	5,376,400	2,196,000	3,310,000	6,621,500	14,965,000	220,500	32,689,400
Military and Naval Buildings	.....	10,000	185,000	.....	235,000	81,000	511,000
Public Buildings	1,171,000	98,500	1,586,000	1,109,500	2,274,000	1,067,000	7,306,000
Public Works and Public Utilities	4,272,300	1,609,600	17,462,400	11,401,900	41,931,900	2,469,800	79,147,900
Religious and Memorial Buildings	1,696,500	848,500	1,791,500	1,944,600	4,388,000	82,000	10,751,100
Residential Buildings	9,249,900	53,418,800	26,669,800	13,963,800	44,695,300	2,774,900	150,772,500
Social and Recreational Buildings	2,865,500	2,980,500	1,343,000	2,240,500	5,737,000	367,000	15,533,500
Total	$43,778,200	$88,669,000	$65,794,900	$51,404,300	$176,859,000	$9,353,500	$435,858,900



Two Houses for One

By A. H. SCOTT

THE day of the large many roomed mansion is passing. This is clearly evident from the number of these big old fashioned houses now on the market. In many cases the death of the owner has resulted in their being closed; the heirs not feeling that they could afford to reopen them due to the expense of maintenance, difficulty of heating, etc.



Such places are usually white elephants in the hands of real estate dealers who are unable to either sell or rent them. There are hundreds of these houses throughout New England which contain material which is too valuable to be allowed to fall into decay and which could be profitably utilized by either tearing down the houses and using the material in the construction of smaller dwellings or by actually cutting them up and remodeling the sections into a number of attractive homes.

The latter course was adopted in Pittsfield, Mass., with the twenty-room house shown in the accompanying views. The project was carefully gone into and it was decided that the building could be literally sawed in two and the resulting sections remodeled into nine and ten-room houses, respectively.

The work of separating the house into sections and moving them to their new locations was done as expeditiously as possible and at a time when favorable weather was anticipated. Precautions were taken, however, to protect the exposed portions with roofing paper as will be observed by referring to the top illustration.

One of the sections was moved across the street and passed between two houses to the next street while the other was moved into position directly in back of it, each house now being on a different street. The material in this old house is of the best and the workmanship painstaking and fine, so that the sections withstood the moving process without damage.

The new owners, therefore, will be assured of having houses of lasting quality and of better workmanship and materials than can be obtained today except at an expense that would prove prohibitive in the majority of home building projects.

The smaller, dark shingled section was moved across the street and through to the next street, while the larger, white painted section remained on the same street, but was moved across to the opposite side.

Note that the bottom view of the dark shingled house is so taken that the rear view of the house built of the other half section is visible across the block on the next street.

The architect who planned the division of the house and rebuilding of the sections was J. A. Vance, and the contractor was C. B. Lindholm, both of Pittsfield, Mass.





Legal Department

WHERE a sub-contract to erect the superstructure of a federal building contemplated commencement of the work by the sub-contractor about May 1st, but the contractor delayed completion of necessary piling, etc., until the latter part of July, the sub-contractor was justified in declaring a cancellation of his agreement. It was so decided by the Michigan Supreme Court in the recent case of Interstate Construction Co. vs. Montague Brothers and United States Fidelity & Guaranty Co., 174 Northwestern Reporter, 173.

Does Delaying Sub-Contractor Release Him?

On the vital point involved the court remarks:

"The record shows conclusively that it was within the contemplation of all the parties that the work to be performed by the defendants under the sub-contract was to commence within a reasonable time after May 1st. It further shows that defendants prepared at considerable expense to commence performance shortly after that date. A delay of nearly three months ensued, on account of plaintiff's failure to get the piling and foundation in proper shape to permit defendants to undertake the performance of their part of the contract. In the meantime labor conditions had materially changed, or would change before it would be possible for the defendants to complete. Having elected to repudiate the contract, by reason of the antecedent breach thereof by the plaintiffs, we think it was competent for defendants to show that performance thereof under the changed conditions occasioned by the unwarranted delay would have imposed upon them an extraordinary and unwarranted burden."

Accordingly, the court affirmed a dismissal of the contractor's suit to recover on the sub-contractors' bond as for their breach of the sub-contract.

Another interesting and important point involved in this case pertained to the effect of a telegram sent on the date of the execution of the formal contract between plaintiff contractor and defendant sub-contractors. The contract provided promptly upon notice." A telegram sent by the contractor to the sub-contractors, relating to the contract, contained the sentence: "You to start work about May 1st." It was objected by the contractor, in the course of the litigation, that the telegram should be disregarded, the contract speaking for itself. But the Supreme Court says:

"Both papers had reference to the same subject-matter and were parts of a single transaction, and both may be examined for the purpose of ascertaining the agreement of the parties. That agreement would appear to be that the sub-contractor should commence work promptly upon notice, as stated in the contract, and 'about May 1st,' as explained in the telegram."

In a similar case (Hale & Kilburn Co. vs. Gill et al., 257 Federal Reporter, 906) the United States Circuit Court of Appeals, Sixth Circuit, decided that a sub-contractor was not necessarily released from an agreement to install metal doors and trim, picture molding, etc., because the contractor failed to have the building ready for installation of the doors by the time originally contemplated. But this decision is to be reconciled with that of the Michigan court on the ground that in the latter case time was made a vital element of the contract and the sub-contractors never waived their right to have that the work should be "commenced the foundations, etc., ready for erection of the superstructure by the agreed time, whereas in the case before the Circuit Court of Appeals it was found that the sub-contract for installation of the doors did not necessarily make time a vital factor, and that the sub-contractor might be found to have waived requirement that the building be ready for the doors, etc., by a certain time.

The evidence being conflicting as to whether the contractor in the door case unreasonably delayed the sub-contractor, and as to whether the sub-contractor had waived any right to complain of the delay in having the building ready for the doors, the Circuit Court of Appeals holds that it was for the jury to determine whether there was such unreasonable delay or such waiver.

The delay was caused by the general contractor's controversy with the city over the height of the building and its structural strength, and by unforeseen necessity for deeper foundations, etc. It was originally supposed that the building would be ready for the installation of the doors about October 1st, but it was not ready until December. In the meantime and on October 16th, the sub-contractor gave notice of his cancellation of the sub-contract.

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age, 920 Broadway, New York City.

AVERY instructive appellate court decision on the subject of the measure of damages recoverable by a building contractor where he is wrongfully prevented by the owner from fully performing his agreement appears in the case of Di Luck vs. Bradner Co., 190 Pacific Reporter, 904, decided by the Washington Supreme Court.

Damages Recoverable for Termination of Contract by Owner

The Superior Court in Seattle allowed plaintiff damages for wrongful cancellation of a contract for the construction of floors in an apartment building, but

the Supreme Court reduced the amount of the award on the ground that excessive damages were awarded, saying:

"The testimony shows that the profits which might reasonably be anticipated upon the contract as awarded would amount to $332.85; this being the difference between the contract price and what it would have cost the plaintiff to have performed the work called for in the contract. . . . The testimony also shows that, had the contract been performed, the plaintiff intended to work thereon, and he would have been provided with 34 days of work at $7 per day, and that during the period he would have been performing the contract he diligently sought for other work and secured it, for which he earned $105, and the judgment allowed him the difference between $238 and $105, or $133.

"This second item of damages was erroneously allowed for the reason that the contract was a building contract, and not a contract for services, and plaintiff is not entitled to double damages by treating it as both sorts of contracts. When the work was done, had he completed it, he would only have received the contract amount, which would have included his own work or the work of whomsoever he had employed in his stead; for all of the work was to be done for the price of the contract. When the defendants let the contract, they were not hiring the plaintiff, nor was it material to them whether he labored himself or secured and paid for the labor of others."

Sufficiency of Contractor's Monthly Statement of Work Done

A CLAUSE in a building contract requiring the contractor to furnish monthly statements to the supervising architect in writing, "setting forth the exact percentage of the materials received at the building and the exact percentage of the work installed" as a basis for making partial payments, "is not complied with by a mere general statement of percentages, holds the California District Court of Appeal in the case of Sinnott vs. Schumacher, 187 Pacific Reporter, 105.

In this case it was decided that the builder failed to entitle himself to partial payment by furnishing a statement "that the exact percentage as near as is possible to make it of the materials received at the building is 8 per cent. thereof, and the exact percentage of the work installed as near as is possible to make it is 8 per cent. thereof." The court says:

"The purpose of requiring such a report from the contractor to be made to the architect is manifestly to enable the architect to correctly compute the amount of the installment which shall be due and payable to the contractor on the first day of each month as the work progresses, and it should require no argument to show that the mere general statement or conclusion of the contractor as to the percentage of materials received and work installed upon the building at the time he requires the installment payment upon the cost thereof does not amount to a compliance with the foregoing provision of this contract."

Accordingly, it was decided that for want of proper statement, the owner was not in default in failing to make a partial payment, and that refusal to make the payment constituted no such breach on the owner's part as justified the builder in throwing up the work.

Transaction of Business by Corporation in Other States

IN the course of a year corporate building contractors frequently take long chances, unwittingly, on becoming unable to collect compensation for work done in states other than where they were incorporated. This risk rises from the fact that most states have laws forbidding transaction of business within their borders by corporations not organized in the state, unless such corporations first obtain a permit to do business in the state by filing copies of their articles of incorporation, etc. Compliance with these laws is often overlooked.

But since these laws do not affect the right of a corporation to do an interstate business, being limited in their effect to the transaction of purely intrastate business, it often becomes a doubtful question as to whether a certain transaction is interstate or intrastate. There is no room for doubt that ordinary building operations are of purely local nature, although the nonresident corporation may ship the materials, and send workmen, from its home state to the place where the work is to be done. On the other hand, it has been decided that where things of a complex nature, requiring expert services in installing them, are shipped into a state from the outside, performance of the work of installation by the nonresident company's nonresident expert employees does not constitute such doing of business by the company in the state as makes obtaining of a permit necessary.

In the recent case of Decorators' Supply Co. vs. Chausee, 178 Northwestern Reporter, 665, decided by the Michigan Supreme Court, plaintiff was denied the right to recover for ornamental plaster work installed in a school building at Sault Ste. Marie, because it was a nonresident corporation and had failed to obtain a license to do business in Michigan. The company's attorneys attempted to show that the case fell within the rule last above stated, but the Supreme Court said:

"One local man was used to assist the factory representative in the erection of the material. The record discloses that there are concerns in at least two or three cities in Michigan furnishing ornamental plaster work in competition with the plaintiff, and it is apparent that there are mechanics in the state entirely competent to erect such material. We think it is equally apparent that there is no such 'intrinsic or peculiar quality or inherent complexity' in the article sold in the case at bar as would prevent its sale unless erected by the vendor. . . .

"The circuit judge was correct in holding that the plaintiff cannot succeed, because it was an undomesticated foreign corporation, engaged in instrastate business."

When Lien and Compensation Rights Are Lost

THE Iowan Mechanics' Lien Law, like the statutes of some of the other states, contains a provision to the effect that the granting of liens in favor of sub-contractors shall not be regarded as requiring the owner to pay any greater amount to discharge a lien or at any earlier date than is provided for payment in his contract with principal contractor.

Applying this statute in the case of Kawneer Manufacturing Co. vs. Renfro & Lewis et al., 173 Northwestern Reporter, 899, the Iowa Supreme Court holds that where, under the terms of a building contract, nothing has become due the contractor because of his failure to complete work, no lien can be established in favor of him, a materialman, or subcontractor.

In this case plaintiff sought to establish a lien for lumber furnished to a general contractor, but failed because it appeared that the principal contract did not provide for any payment until after the completion of the building, and that the building fell before being completed or delivered to the owner.

"By that contract," says the court, "the owners agreed to pay the stated price when the work was completed according to the plans and specifications, and they cannot be put in default until those terms are complied with. Concededly the principal contractors have never performed, and have therefore never become entitled to payment. Proof of their negligence and the consequent destruction of the building is only material as showing the destruction of the subject-matter of their employment was not due to the fault of the owners.

"The contractors are denied the right to recover, not because of their negligence, but because they have not performed their agreement. Had they abandoned the building in its unfinished condition, or had tendered or turned it over to the owners in such condition, then the question of substantial performance, or whether they could recover the reasonable value of the work done, would be of pertinence; but it has none under the record as it stands."

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	Jan. 25	Feb. 25
LONG LEAF YELLOW PINE		
B. and Better Edge Grain Flooring, 2½" Face	$81.00	$79.00
Dimensions, S1S1E, No. 1 Common, 2x4", 10'	40.00	38.00
Timbers, Merchantable, '05, 12x12", 10 to 20'	49.50	49.50
B. and Better Ceiling, ½x3¼	32.50	42.50
B. and Better Finish, 1x4"	64.00	64.00
No. 1 Common Boards, 1x8"	42.00	40.00
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13/16x2½"	$67.00	$67.00
Roofers, 13/16x5½"	29.00	29.00
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3"	$78.50	$78.50
No. 1 Clear V. G. Flooring, 1x4"	76.00	76.00
No. 2 Clear and Better Ceiling, ½x4"	45.00	45.00
No. 2 Clear and Better Novelty Siding, 1x6"	52.25	54.00
No. 2 Clear and Better V. G. Stepping	90.12	90.12
Dimension, S1S1E, 2x4", 16'	40.00	40.00
Timbers, S1S1E, 12x12", 16'	96.50	96.50
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M	$7.60	$7.40
Washington Perfection Shingles, per M	7.20	7.15
Clear Bevel Siding, ½x6"	43.50	43.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½"	$8.25	$8.25
Dimension, 2x4", 10 to 16'	34.00	34.00
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2x2¼"	$160.00	$160.00
Clear Plain White Oak	115.00	115.00
Clear Maple, 13/16x2¼"	96.50	96.50
Clear Quartered White Oak Parquetry Strips, 5/16x2"	142.50	142.50
Clear Plain White Oak Parquetry Strips	87.50	87.50
(All lumber prices furnished by NATIONAL LUMBER MERCHANT)		
COMMON BRICK—		
Per M. f. o. b. job	$18.00	$22.60
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered	$2.30	$2.30
STRUCTURAL STEEL (IRON AGE)—		
Per 100 lb. to large buyers	$1.88	$1.83
CRUSHED STONE (cu. yd.)—		
¼ in.	$3.00	$2.55
1½ in.	2.90	2.65
WALL BOARD—		
Per 1,000 sq. ft. io lots under 1,000 sq. ft.	$60.00	$60.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.	55.00	55.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered	$20.65	$18.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered	24.60	20.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	27.35	23.00
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag	$0.60	$0.60
Masons, per 50 lb. bag	.45	.45
SAND AND GRAVEL (cu. yd.)—		
Sand	$1.75	$1.65
¾ in. gravel	3.00	2.80
1½ in. gravel	3.00	2.80
FACE BRICK—		
Tapestry (delivered)	$45.00	$45.00
Caledonian (delivered)	40.50	40.50
Smooth Grey (delivered)	50.00	50.00
Fisk Lock f. o. b. factory	32.50	32.50
SHINGLES (per square)—		
Asphalt single	$7.50	$7.50
Asphalt strip	7.00	6.50
STAINED WOOD SHINGLES (per square, delivered)—		
16 in. Extra Clear	$10.50	$10.50
18 in. Eureka	10.60	10.60
18 in. Perfection	11.65	11.65
24 in. Royal	11.00	11.00
24 in. Imperial	11.70	11.70

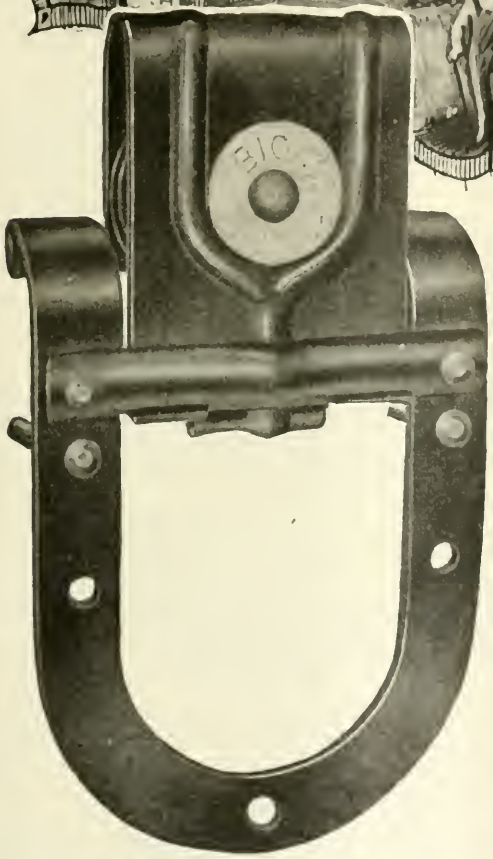
CHICAGO PRICES

YELLOW PINE—		
Boards, 1x8, No. 1 Com	$37.00	$37.00
Casing and Base, 6-8 in.	60.00	64.00
Ceiling, ½x4, B. and Btr.	43.00	43.50
Dimension No. 1, 2x4, 12 to 14 ft.	32.00	31.00
Drop Siding, 1x6, B. and Btr.	48.00	48.00
Finish, 1x4, B. and Btr.	60.00	58.00
Flooring, B. and Btr. E. G., 1x3	75.00	70.00
Lath, 4 ft., No. 1	6.65	6.65
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	40.00	43.00
NORTHERN HEMLOCK—		
Boards, No. 1, 8 to 16 ft., 1x6 to 8 in.	$30.50	$30.50
Lath, 4 ft., No. 1	9.75	9.75
DOUGLAS FIR—		
Boards, No. 1, S2S, ¾ in., 1x8 to 10 in.	$29.25	$29.25
Dimension, No. 1, S1S1E, 8 ft., 12 ft., 14 ft., 2x4 in.	29.50	29.50
Drop Siding, 1x6 Pat. 106, No. 2, C. and Btr.	44.50	45.50
Flooring V. G., 1x4, No. 1	68.50	66.50
Lath, 4 ft., No. 1	9.40	9.25
Timbers, No. 1 Com., 12x12 in. and under, 40 ft. and under, rough	38.50	39.00
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear	$94.75	$94.75
Oak Flooring, 13/16x2¼, Cl. Pl., White	109.00	109.00
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear	$38.25	$38.25
Finish, S2S or S4S, 1x6 to 8 in. clear	81.50	81.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear	$43.00	$41.00
Shingles, Extra Clears, 16 in.	5.00	4.66
COMMON BRICK—		
Per M. f. o. b. job	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$1.97	$1.97
STRUCTURAL STEEL—		
Per 100 lbs. to large buyers	$1.88	$1.83
CRUSHED STONE (cu. yd.)—		
¾ in.	$1.75	$1.75
1½ in.	1.75	1.75
WALL BOARD—		
Per 1,000 sq. ft. in lots 1 M to 2½ M	$57.50	$57.50
Per 1,000 sq. ft. in lots under M	52.50	52.50
SAND AND GRAVEL (cu. yd.)—		
Sand	$1.75	$1.75
¾ in. gravel	1.75	1.75
1½ in. gravel	1.75	1.75

ST. LOUIS PRICES

YELLOW PINE—		
Boards, No. 1 Com., 1x4	$31.50	$31.50
Partition, ¾x3¼, B. and Btr.	55.00	55.00
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	30.00	29.00
Finish, S2S, B. and Btr., 1x4	56.00	56.00
Flooring, B. and Btr., E. G., 1x3	73.25	73.25
Flooring, B. and Btr., F. G., 1x3	61.25	58.00
Lath, 4 ft., No. 1	5.80	6.25
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	35.00	35.00
DOUGLAS FIR—		
Ceiling, F. G., ½x4 in., No. 2, Cl. and Btr.	$38.25	$38.25
Dimension, No. 1, S1S1E, 2x4 in., 8, 12, 14 ft.	29.50	31.00
Drop Siding and Rustic, 1x6 in., No. 2, Cl. and Btr.	42.50	45.50
Finish, F. G., S2S or S4S, 1x4 in., No. 2 Cl. and Btr.	69.25	66.25
Flooring, 1x4 in., No. 1, Cl., V.G.	68.50	65.50
Stepping, V.G., 1¼x10 in. & 12 in., No. 2, Cl. & Btr	81.75	81.75
CALIFORNIA REDWOOD—		
Finish, S2S, Cl., 1x6 in.	$81.50	$81.50
Siding, 4 in. Bevel, 10 to 20 ft.	38.25	38.25
8 inch Colonial	66.75	66.75
8 inch Bungalow	68.75	68.75
HARDWOODS—		
Oak Flooring, ¾x1½ and 2 in., Clear Qtr. White	$110.75	$113.25
Maple Flooring, 13/16x2¼ in., Clear	96.75	101.75
RED CEDAR—		
Siding, ½x6, Clear	$41.00	$41.00
Shingles, Clears	4.56	4.71
COMMON BRICK—		
Per M., f. o. b. job	$16.00	$16.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.20	$2.20
STRUCTURAL STEEL—		
Per 100 pounds to large buyers	$1.97	$1.92
CRUSHED STONE (cu. yd.)—		
¾ in.	$1.83	$1.83
1½ in.	1.83	1.83
WALL BOARD—		
Per 1,000 sq. ft. in lots under M	$60.00	$60.00
Per 1,000 sq. ft. in lots 1 M to 2½ M	55.00	55.00
SAND AND GRAVEL (cu. yd.)—		
Sand	$1.20	$1.20
¾ in. gravel	1.30	1.30
1½ in. gravel	1.25	1.25





"BIG 4"
BARN-DOOR HANGER

The Up To Date Farm

Is the farm with clean, well-kept buildings, where the doors are hung so they will open at a touch but won't jump the track.

The "Big 4" Hanger makes possible the hanging of doors that roll easily and smoothly. The door may be swung outward if necessary, but it will never jump the track.

Easy to install. Comes packed ready for use with bolts. We supply our dealers with model doors that show how easy the "Big 4" operates.

Your dealer will demonstrate

National Manufacturing Company

Sterling **Illinois**

Selected List of Manufacturers' Literature

FOR THE SERVICE OF BUILDERS, CONTRACTORS, ARCHITECTS AND ENGINEERS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to Building Age and The Builders' Journal, 920 Broadway, New York, or the manufacturer direct, in which case kindly mention this publication. Either the titles or the numbers may be used in ordering.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

ANCHORS—See Bolts

ASBESTOS PRODUCTS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

1. *Ambler Asbestos Shingles.* Catalog. 5½ x 8½ in. 40 pp. Illustrated.
2. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog. 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.
3. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog. 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
4. *Ambler Asbestos Building Lumber.* Catalog. 8½ x 11 in. 32 pp. Illustrated.
5. *Engineers' Data Sheets.* Catalog. 8½ x 11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.

ASBESTOS ROOFING—See also Roofing

ASH HOISTS—See also Hoists

Gillis & Geoghegan, 537 West Broadway, New York, N. Y.

6. *General Catalog.* Contains specifications in two forms, (1) using manufacturer's name, and (2) without using manufacturer's name. Detail in ¾ in. scale for each telescopic model and special material handling section. Fully illustrated with photographs of actual installations and descriptive matter of same. 20 pp., 2 colors, 8½ in. x 11 in.

ASH RECEIVERS

Sharp Rotary Ash Receiver Corporation, 396 Bridge St., Springfield, Mass.

7. *Catalog E.* Booklet describing the Sharp Rotary Ash Receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6 x 9¼ in.
8. *Catalog F.* A book for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with tables of dimensions for installation. 8 pp. Ill. 6 x 9¼ in.

BALANCES, SASH

Caldwell Mfg. Company, The, Rochester, N. Y.

9. *Suggestions for the Present-Day Architect.* Booklet. 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.

Pullman Mfg. Co., Rochester, N. Y.

10. *Catalog* describes new form of sash balance that can be removed and inserted without removing sash from window.

BAND SAWS

American Saw Mill Machinery Co., Hackettstown, N. J.

11. *Catalog No. 22* describing a general line of band saws of various sizes.
12. *Technical Data.* Four-page folder, 8½ x 11 in. containing specifications, description, prices and approximate cost of installation. Everything the architect or contractor requires. Proper size for filling.

Crescent Machine Co., Leetonia, Ohio.

Descriptive 144-page Catalog.

BAR BENDERS AND CUTTERS

Koehring Company, Milwaukee, Wis.

13. *Four-page folder,* giving illustrations and sizes of Koehring Bar Benders and Cutters.

BEDS

Murphy Door Bed Company, Majestic Bldg., Chicago, Ill.

BOILERS—See Heating Equipment

BOLTS

National Lead Company, 111 Broadway, New York, N. Y.

14. *Cinch Bolt Booklet.* An illustrated booklet of Cinch Bolt Specialties. 20 pp. 3½ x 6¼ in.

BOOKS

American Technical Society, Chicago, Ill.
Architectural House Planning Service Co., 20 So. 18th Street, Philadelphia, Pa.
Arrow Book Company, 347 Fifth Avenue, New York City.
U. P. C. Book Company, 243 West 39th Street, New York City.
Frank R. Walker Co., 2209 B Archer Ave., Chicago, Ill.

BRICK

American Face Brick Association, 110 South Dearborn St., Chicago, Ill.

15. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Sent free.
16. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions and illustrated and described. Size 8½ x 11 in. 116 pp. Price $1.00.
17. *The Home of Beauty.* A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8 x 10 in. 72 pp. Price 50 cents.
18. *Architectural Details in Brickwork.* Three series of beautiful half-tone prints of brickwork detail, contained in closed folders suitable for standard vertical letter file. The three series contain 124 prints in all. Size 8½ x 11 in. Price $1.50 per set.

Common Brick Manufacturers' Association of America, 1309 Schofield Bldg., Cleveland, Ohio.

19. *Brick—How to Build and Estimate.* 3rd edition, 32nd thousand, a manual of solid brick and Ideal wall construction. Contains data on the strength of brickwork, on mortars, bonds and joints and equipment, and contains complete estimating tables for quantities of brick, mortar, material and approximate mechanics' time for various thicknesses and square foot areas of solid and Ideal wall. 8½ x 11 in. 72 pp. Price 25 cents.
20. *Brick for the Average Man's Home.* Book. 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00.

Fiske & Company, Boston, Mass.

Tapestry brick other grades of front brick. Manufacturers of "Fisklock" Brick.

BUILDING CONSTRUCTION—See also Garage Construction

National Manufacturing Co., Sterling, Ill.
Truscon Steel Company, Youngstown, Ohio.

21. *Truscon Floortype Construction.* Form D-352. Contains complete data and illustrations of Floortype installations. 16 pp. Ill. 8½ x 11 pp.
22. *Truscon Standard Buildings.* Form D-398. Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8¼ x 11 in.
23. *Truscon Building Products.* Form D-376. Contains a brief description of each of the Truscon Products. 112 pp. Ill. 8½ x 11 in.
24. *Modern School Construction.* Form D-395. Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill. 8½ x 11 in.

BUILDING HARDWARE—See Hardware

BUILDING STONE—See Stone, Building

BUILT-IN CLOTHES HANGERS

Knape & Vogt, Grand Rapids, Mich.

BUNGALOW AND SMALL HOUSE PLANS

American Face Brick Association, 110 South Dearborn St., Chicago, Ill.

25. *Four booklets* of small houses from 3 to 8 rooms, containing 98 reversible designs. (1) 3-4 rooms, (2) 5 rooms, (3) 6 rooms, (4) 7-8 rooms; size 8½ x 11 in. Each booklet 25 cents, set $1.

Architectural House Planning Service Company, 20 South 18th Street, Philadelphia, Pa.

Keith Corporation, 533 Abbay Bldg., Minneapolis, Minn.

26. *Twelve different plan books* at $1 each. Cottages, bungalows, two-family garages, etc.
27. *Fifty Small Homes of Character.* Price $1. Working drawings, specifications and models of small homes.

CANVAS

Williams L. Barrel Company, 50 Leonard Street, New York.

28. *Consertex Canvas Roofing and Deck Cloth.* Catalog A-1—Roofing Facts and Figures. Consertex is a specially waterproofed and treated roofing canvas guaranteed wear and rot-proof for decks, piazza floors, sleeping balconies, sun parlos, etc., etc.

John Boyle & Co., Inc., 112 Duane Street, New York.

CASEMENTS—See Doors and Windows

CAULKING AND GLAZING COMPOUND

All Metal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill. Illustrated catalog sent on request.

CEILINGS, METAL

The Edwards Manufacturing Company, Cincinnati, O.

33. *Pamphlet* of 32 pages, describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 in.

Keighley Mfg. Co., 124 Third Avenue, Pittsburgh, Pa.

CEMENT

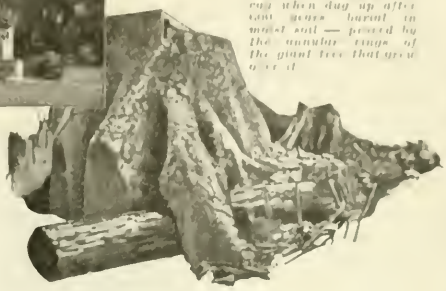
Alpha Portland Cement Company, Easton, Pa.

34. *Alpha Cement—How to Use It.* Handbook 6 x 9 in. 96 pp. Illustrated. A practical handbook on popular forms of concrete construction, including form work, proper proportions in mixing, waterproofing, colored concrete, etc.
35. *Alpha Service Sheets and Bulletins.* Special suggestions on the construction of Industrial Housing, Garages, Inclosure Walls, Steps, Sidewalks, Barns, Silos, Farm Buildings, etc.
36. *Alpha Aids.* A bi-monthly magazine for those who buy, sell or use Portland Cement, sent complimentary to approved names.

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

37. *The Atlas Book on Concrete Construction.* A text book written for the average builder in concrete and from the practical rather than from the technical standpoint. Treats on both plain and reinforced concrete. 144 pp. 4½ x 7 in. Cloth bound. Price $2.00.





This Redwood log was sound and free from decay when dug up after 600 years — buried in moist soil — pressed by the annular rings of the giant tree that grew over it

Where You Should Use Rot-Resisting Moisture-Proof Redwood

FOR siding and porch work on which climbing vines retain moisture and foster the development of mould and decay, for shingle roofs shaded by trees so that they dry out slowly—wherever moisture lodges you can guarantee freedom from rot and decay if you use Redwood.

In addition to rot-resistance, which is due to a *natural* odorless preservative that permeates every fibre of Redwood during the growth of the tree, you will find that the high percentage of clear lumber in every car of our production cuts waste to a minimum. There's an evenness of texture and a uniformity about T. P. L. Co. Redwood, a dependable dryness and easy wood-working quality that keeps down labor costs.

You can buy T. P. L. Co Redwood lumber and mill work at prices not greatly higher than for other lumber which cannot compare with Redwood for rot-resistance, freedom from shrinking, swelling and warping, for good painting surfaces, and low average of knots, splits and other common defects.

For the convenience of builders and architects we have recently issued our "Construction Digest" and our "Engineering Digest," which either our New York or Chicago office will gladly forward on request, together with mill work and frame lists of Redwood items of our manufacture. Write for them.

THE PACIFIC LUMBER CO. of Illinois
2076 McCormick Bldg. Chicago — 832 No. 40 Rector St. Bldg. New York City
THE PACIFIC LUMBER CO.,
San Francisco — Los Angeles
Export Company
A. F. THANE & CO., 40 Rector St., New York City
311 California St., San Francisco

T P L C

The Pacific Lumber Co.

Redwood

The Largest Manufacturers and Distributors of California Redwood

Redwood should be specified for

Exterior Construction
including Colonial siding, cornboards, shingles, door and window frames, gutters, eaves, water tables and mouldings; porch rail, balusters and columns; mouldings and lattice.
Pickets and fencing; pergolas and greenhouses.

Interior Finish
Natural, stained or painted.

Industrial Uses
Tanks and Vats for water, chemicals and oil.
Factory roofs and gutters.
Wood block flooring

Wood Specialties
such as Caskets and Burial Vaults
Incubators and ice-cream cabinets
Cigar and candy boxes, etc

Railroad Uses
such as railroad ties and tunnel timbers
Signal wire conduits and water tanks
Car siding and roofing

Farm and Dairy Uses
such as silos, tanks and troughs
Hog feeders and implement sheds
Wood block floors, etc

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 66*

30. *Set of Blue Prints.* Drawings showing how to apply Portland Cement stucco to the different standard types of wall construction. Appended are tables of the quantities of cement, and sand required to cover a given wall surface. Size 8½ x 11.
31. *Concrete on the Farm.* The most comprehensive book of its kind. Practical and thoroughly reliable instructions, with plans and pictures of all possible farm structures for which concrete can be used. Complete directions in practical terms for selection of aggregates and the mixing and placing of concrete.
32. *Other Publications.* The Atlas Portland Cement Company has numerous other publications, covering nearly every phase of concrete construction. Their Service Department will give sound advice on any phase of concrete construction to anyone applying for it.

Koehring Company, Milwaukee, Wis.
38. *Concrete—Its Manufacture and Use.* Book. 4½ x 7 in. Illustrated. 207 pp. Comprehensive discussion from the practical standpoint of concrete.

Lehigh Portland Cement Co., Allentown, Pa.
40. *The Expensive Proof Farm.* Book of 96 pp. Illustrated. Showing methods of constructing various buildings, fence posts, water troughs, etc., used about the farm.

Portland Cement Assn., Chicago, Ill.

CHAINS

Bridgeport Chain Co., Bridgeport, Conn.
29. *Catalog No. 14.* Contains 64 pp. Illustrated, of different chains that can be used in all parts of building construction.

CLAMPS

James L. Taylor Mfg. Co., Poughkeepsie, N. Y.

COLUMN AND BEAM COVERING

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
39. *32-page booklet*, 8½ x 11. Pyrobar Tile.

CONCRETE APPLIANCES

Badger Concrete Mixer Co., Majestic Bldg., Milwaukee, Wis.
Universal Cement Mfd Co., No. Milwaukee, Wis.
41. *Illustrated Folder* describing mold for building hollow concrete walls for homes, garages, barns, silos, etc.

Van Guilder Double Wall Co., 77 South Avenue, Rochester, N. Y.
42. *A Catalog* describing the Van Guilder system of portable forms for the building of hollow concrete walls on the thermos bottle idea for the erection of homes, ice houses, barns, silos, etc. Walls are dry, as there is continuous air space around entire building.

CONCRETE MACHINERY

A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
43. *Descriptive Illustrated Circular* of Magic Concrete Mixer.

Archer Iron Works, Western Avenue and 34th Street, Chicago, Ill.
44. *Illustrated Catalog* of hoist tower equipment, spouts, concrete mixers, hoppers, derricks, tracks, cars, screens, etc. 32 pp.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
Construction Machinery Co., 403 Vinton Street, Waterloo, Iowa.
Ideal Concrete Machinery Co., 1334 Monmouth Street, Cincinnati, Ohio.
Jaeger Machine Co., 216 Dublin Avenue, Columbus, Ohio.
Koehring Co., Milwaukee, Wis.
46. *Koehring Construction Mixers.* Booklet. 7¾ x 10½ in. Illustrated. 96 pp. Complete information on construction type concrete mixers.
47. *Koehring Dandie Mixer.* Booklet. 6 x 9 in. Illustrated. 24 pp. Illustrating and describing Koehring line of Dandie light mixers.

Little Whirlwind Mixer Co., 438 Gould Street, La Crosse, Wis.
Ransome Concrete Machinery Co., 1774 Second Street, Dunellen, N. J.
Republic Iron Works, Box 602, Tecumseh, Mich.
Standard Scale & Supply Co., 1631 Liberty Avenue, Pittsburgh, Pa.

CONCRETE MARBLE

Art Stone Co., Waynesboro, Pa.
45. *Descriptive Circulars* with illustrations of different marbles in colors. Sent free to any interested party.

CONSTRUCTION, FIREPROOF

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
226. *Standard Fire Proofing Bulletin* 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fireproof floor construction.

National Pressed Steel Co., Massilon, Ohio.
United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
48. *Pyrobar Gypsum Tile.* Booklet. 8½ x 11 in. 32 pp. Illustrated. Detail and specifications for fireproof partitions.
49. *Bulletins*, 8½ x 11 in. Containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

DAMP-PROOFING

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
Cortright Metal Roofing Co., Philadelphia, Pa.
Illinois Zinc Co., 280 Broadway, New York.
National Sheet Metal Roofing Co., 339 Grand Street, Jersey City, N. J.
Rochond Co., Van Went, Ohio.
F. C. Sheldon Slate Co., Granville, N. Y.

DOOR CHECKS

Park Manufacturing Co., Worcester, Mass.
50. *Catalog* contains description of six models of the new improved Worcester-Blount Door Check.

DOORS AND WINDOWS

Hess Warming & Ventilating Co., 1201 Tacoma Bldg., Chicago, Ill.
Henry Hope & Sons, 103 Park Ave., New York.
51. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¼ x 18½ in. 32 pp.

Paine Lumber Co., Oshkosh, Wis.
54. *Illustrated Catalog* of 36 pp. describing the new style "Miracle" Door.

Truscon Steel Company, Youngstown, Ohio.
52. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.
53. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill. 8½ x 11 in.

DOOR AND WINDOW FRAMES

Andersen Lumber Company, South Stillwater, Minn.
55. *General Catalog* for architects, contractors, engineers, carpenters or builders. Describes and illustrates fully Andersen Standard White Pine Window, Cellar Frames, Sash Frames and Door Frames. Gives details of construction, variety of sizes and uses for ordinary as well as special construction, and method of assembly. Size 7¾ x 10¾, 24 pages.
56. *Better Frames for Less Money* for consumers. Interesting folder showing advantages of Andersen Standard White Pine Frames. Uses, sizes and details of construction.

DUMBWAITERS

Kimball Bros. Co., 1106 Ninth Street, Council Bluff, Iowa.
Sedgwick Machine Works, 156 W. 15th Street, New York.
57. High grade Hand Power Elevators and Dumbwaiters for All Purposes. Illustrated catalog, 52 pages; dumbwaiter service sheet, and pamphlets descriptive of many special types of outfits.

Williamsport Wire Rope Co., Williamsport, Pa.

DRAFTING MATERIALS

A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton Street, New York.
Wickes Bros., 1301 Water Street, Saginaw, Mich.

ELEVATORS

Kimball Brothers Company, Council Bluffs, Iowa.
58. *Kimball Elevators.* An illustrated catalog of hand power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7¾ x 10½ in.

Richards-Wilcox Mfg. Co., Aurora, Ill.
59. *"Ideal" Elevator Door Equipment.* Catalog showing elevator door hangers for one, two and three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.

Sedgwick Machine Works, 156 West 15th Street, New York.

FACTORY EQUIPMENT

The Edwards Mfg. Co., Cincinnati, Ohio.
60. *Edwards' Steel Equipment.* Illustrated catalog. Showing steel lockers and shelving for factories, offices, stores, schools and hospitals, together with illustrations and description of "Edmanco" steel office furniture and filing cabinets. Size 8 x 11 in. 32 pp.

FIREPLACES AND MANTELS

Stover Mfg. & Engine Co., 747 Lake Street, Freeport, Ill.
Strait & Richards, Inc., Newark, N. J.
62. *Catalog* describing fireplaces, electric and gas logs, heating supplies, heaters, etc.

FLOOR HARDENERS

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
61. *Agatex and Its Performances.* Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FLOORING

The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
63. *The Perfect Floor.* Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5½ x 7¾ in.

Maple Flooring Mfgs. Assn., Stock Exchange Bldg., Chicago, Ill. Booklet, How to Lay and Finish Maple, Beech and Birch Floors.

Oak Flooring Manufacturers Association, 1014 Ashland Block, Chicago, Ill.
64. *Modern Oak Floors.* Booklet. 6½ x 9¼. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
65. *Oak Flooring, How and When to Use It.* Booklet. 3½ x 6½ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.

Pacific Lumber Co., 2070 McCormick Bldg., Chicago, Ill.
United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.
66. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins, 8½ x 11. Pyrofill.

Wood Mosaic Co., New Albany, Ind.

FLOOR SURFACING

Amer. Floor Surfacing Machine Co., 521 So. St. Clair Street, Toledo, Ohio.
Waywell Chappell & Co., 137 No. Jackson Street, Waukegan, Ill.
M. L. Schleuter, 223 W. Illinois Street, Chicago, Ill.
Universal Floor Scraper Co., 110 Exchange Street, Worcester, Mass.



IMPERISHABLE as ancient masonry —trust-worthy as the staunch pillars of the storied Parthanon of old Greece, KELLASTONE today is the symbol of modern architectural beauty, durability and strength.

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IMPERISHABLE STUCCO

is the original all-mineral magnesite stucco — uniform in composition — dependable in performance — supreme in unvarying high quality — universally recognized as the most reliable and economical wall covering material of the Age.

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Room 517
155 E. SUPERIOR STREET
CHICAGO, ILL.

KELLASTONE
IMPERISHABLE STUCCO

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 68*

FLOOR VOIDS FOR USE IN CONCRETE

United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.

67. *Loose-leaf Bulletins.* 8½ x 11. Pyrobar Gypsum Floor Tile.

FURNACES—See Heating Equipment

GARAGE CONSTRUCTION

National Mfg. Co., Sterling, Ill.

GARBAGE DESTROYERS

Kerner Incinerator Company, 1027 Chestnut Street, Milwaukee, Wis.

68. *The Sonitory Elimination of Household Waste.* M-3 Folder. Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. 4 x 9 in.

GLASS

American Window Glass Co., Pittsburg, Pa.

69. Send for circular describing different varieties of window glass and how to select the proper kind.

American Three-Way Luxfer Prism Co., Cicero (Chicago), Ill.

70. Write for details and prices of glass prisms that will project daylight into dark interiors.

71. Other literature with reference to apartment house installations.

GYPSUM

U. S. Gypsum Company, 205 W. Monroe Street, Chicago, Ill.

HARDWARE

Caldwell Mfg. Co., 5 Jones Street, Rochester, N. Y.
Griffin Mfg. Co., Erie, Pa.
Hardware Sales Co., 500 Fifth Avenue, New York.
H. B. Ives Co., New Haven, Conn.
The Kawneer Co., Niles, Mich.

72. *Kawneer, Simplex Window Fixtures.* Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½ x 10¾ in. 16 pp.

Knape & Vogt Mfg. Co., Grand Rapids, Mich.

73. Garment Hangers—Send for illustrated booklet.

Monarch Metal Products Co., 5020-26 Penrose Street, St. Louis, Mo.

74. *Monarch Control Locks.* An illustrated pamphlet describing a control lock for outswinging casement windows. It does not mar the woodwork and does not interfere with screens nor disarrange the drapes. Holds windows firmly open at any angle. 4 pp. 8½ x 11 in.

F. E. Myers & Bro. Co., Ashland, Ohio.
National Mfg. Co., Sterling, Ill.
Richards-Wilcox Mfg. Co., Aurora, Ill.

75. *Modern Hardware for Your Home.* Catalog of bangers for vanishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Slidetite" garage door hardware. 24 pp. Illustrated. 8½ x 11 in.

Sargent & Company, New Haven, Conn.
The Stanley Works, New Britain, Conn.

76. *Wrought Hardware.* New 1921 Catalog. This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 376 pp. Illustrated. 6¾ x 9¾ in.

77. *Garage Hardware.* Booklet, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustration and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.

78. *Eight Garages and Their Stanley Hardware.* Booklet. Plans, drawings and complete hardware specifications. Size 5 x 7 in. 32 pp.

79. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in. 32 pp.

HEATING EQUIPMENT

Co-operative Foundry Co., Rochester, N. Y.
Manufacturers of pipeless furnace.

The Farquhar Furnace Company, Wilmington, Ohio.

80. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Illustrated 4¾ x 9¼ in.

81. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Illustrated. 8½ x 11 in.

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

Hess Warming & Ventilating Co., 1205D Tacoma Building, Chicago, Ill.

82. *Modern Furnace Heating.* Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.

Kelsey Heating Company, James Street, Syracuse, N. Y.

83. *Booklet No. 5.* 4 x 9. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacties, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.

84. *Monroe Pipeless Booklet.* 4½ x 8 in. 20 pp. Illustrated.

85. *Monroe Tubular Heater.* Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.

86. *Syracuse Pipeless Booklet.* 4½ x 8 in. 12 pp. Illustrated. General Booklet giving sizes and capacities.

87. *Valves, Syphons and Traps.* A series of pamphlets to enclose in envelopes, describing the well known Thermostatic Return Line Valves and other heating equipment specialties made by this company.

Sill Stove Works, Rochester, N. Y.
The Steam Corporation, 215 No. Michigan Avenue, Chicago, Ill.
Strait & Richards, Inc., Newark, N. J.

88. *Catalog* describing fireplaces, electric and gas logs, heaters, etc.

HOISTS—See Elevators

American Saw Mill Machinery Co., Hackettstown, N. J.

89. *Bulletin No.* 10 describing several kinds of builders' hoists.

C., H., and E. Mfg. Co., Milwaukee, Wis.

90. *Bulletin No.* 3. Hoists and Mortar Mixers.

HOLLOW TILE

Fiske & Company, Boston, Mass.
National Fire Proofing Co., Pittsburgh, Pa.

INCINERATORS—See Garbage Destroyers

INSULATION

Bird & Son., Inc., East Walpole, Mass.

91. Neponset Black Building Paper, samples sent on application.

Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.

92. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.

Brown Co., Portland, Me.

93. Send for samples of "Bermico" Sheathing paper—different weights for all purposes of insulation.

Samuel Cabot, Inc., 141 Milk St., Boston, Mass.
Cabot's Quilt. Catalog containing drawings and description.

United States Mineral Wool Co., 280 Madison Avenue, New York, N. Y.

94. *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼ x 6¾ in. 24 pp

JOISTS AND STUDS, PRESSED STEEL

General Fireproofing Co., Youngstown, Ohio.
National Pressed Steel Co., Massillon, Ohio.

96. *Descriptive 4-page folder* on metal lumber for building construction.

Truscon Steel Company, Youngstown, Ohio.

95. *Truscon Structurol Pressed Steel.* Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

KITCHENS AND EQUIPMENT

La Grange Fixture Corp., La Grange, Ind.

LATH, METAL AND REINFORCING

Buffalo Wire Works Co., Inc., 446 Terrace, Buffalo, N. Y.
Write for Booklet 61-F on wire lathing.

General Fireproofing Co., Youngstown, Ohio.

97. *Catalog* describes Herringbone Rigid Metal Lath, how it is applied and used, with detailed drawings, specifications, etc. 32 pp.

National Pressed Steel Co., Massillon, Ohio.
Truscon Steel Co., Youngstown, Ohio.

99. *Hy-Rib and Metal Lath.* 18th Edition. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

LAUNDRY EQUIPMENT

Canton Clothes Dryer Co., Canton, Ohio.

LEVELS

A. S. Aloe Co., 513 Olive Street, St. Louis, Mo.
L. Beckman Co., 1004 Jackson Street, Toledo, Ohio.
Keuffel & Esser Co., Hoboken, N. J.
Kolesch & Co., 138 Fulton Street, New York.
Warren-Knight Company, 136 North 12th St., Philadelphia, Pa.

100. *"Sterling" Levels and Transits.* 32 pp. illustrated catalog. Description, specifications and structural advantages required in modern practice for establishing lines, levels, angles, etc. Vest Pocket Manual of adjustments.

David White Co., 907 Chestnut Street, Milwaukee, Wis.
Wissler Instrument Co., 609 No. Broadway, St. Louis, Mo.

LIGHTING

American Three-Way Prism Co., 1307 South 55 Court, Cicero, Ill.

98. *Descriptive Circular* on the use of prisms for directing light to dark corners.

LIGHTNING RODS

E. G. Washburne Co., 207 Fulton Street, New York.

LUMBER

Arkansas Soft Pine Bureau, 802 Boyle Building, Little Rock, Ark.

101. *Arkansas Soft Pine Handbook.* Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Molding Designs.

102. *The Home You Long For.* Booklet. 8¼ x 11 in. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.

California Redwood Association, 206 Marvin Building, San Francisco, Cal.

103. *California Redwood Homes.* Booklet. 6 x 9 in. 16 pp. Illustrated. Describes the use of Redwood Lumber for various places and conditions in the building of the home.

COVER YOUR BUILDINGS WITH REAL ROOF INSURANCE

All an insurance policy does is to guarantee that the holder will be reimbursed if he sustains a loss—it does **not prevent the loss itself**—it does not stop the lightning's flash—it does not hold back the rush of flame from adjoining properties—it does not keep out dashing rain and the seeping trickle of melting snow and ice.

But you **can** insure against damage by lightning, fire, wind and water, if you put on the **right kind** of tin **roof.** For roofing tin is **fireproof** and not just "fire-resistive." It is water-tight and not just weather-tight. It actually diverts lightning from its destructive path.

Cover your buildings with real roof insurance by using



TARGET AND ARROW

Look for this Trade ➸ *Mark on every Sheet*

ROOFING TIN

(Prior to 1905 called Taylor's "Old Style.")

for the entire roof, or for valleys, gutters and flashings.

Target and Arrow is made by a hand-dipping process based on an old Welsh method of making terne plates which calls for an unusual amount of skill and judgment on the part of the men who carry on this work.

The two men, whose pictures and histories appear on either side of the page, are typical of the workers who make Taylor products.



N. & G. TAYLOR COMPANY

300 Chestnut St., Philadelphia, Pa.

Headquarters for good roofing tin since 1810



One of Our Experts

David Thomas (Tinner), born in Swansea, Wales, in 1858. He learned his trade in a tin mill in the old country. He has been making tin plate for the Taylors for the **past thirty years** and is still going strong.

One of Our Experts

Ben. Price, Sr. (Tinner), who has been making tin plate for **38 years!** Born in Aberavon, Wales. He started to work there in a tin plate mill. Later he came to this country and has been with the Taylor Company since 1909.

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 70*

Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
104. *The Post Everlasting.* Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.
228. *Poles That Resist Decay.* Booklet. 9¾ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.
105. *"From Tree to Trade."* a 48-page illustrated description of the manufacture of lumber from tree to use. Describes methods of logging, construction, etc.

Pacific Lumber Company of Illinois, The, 1105 Lumber Exchange Building, Chicago, Ill.
106. *Engineering Digest.* Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipes, Outbuildings, Irrigation Flumes, Drainage Boxes, Greenhouses, etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.

Southern Cypress Mfrs. Assn., 1227 Poydras Bldg., New Orleans, La.
107. *Many interesting booklets* on the use of Cypress for all purposes.

LUMBER, ASBESTOS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
108. *Ambler Asbestos Building Lumber.* Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½ x 11 in. 32 pp.

MARBLE, ARTIFICIAL

Art Stone Co., Waynesboro, Pa.

METAL FORMS

Blaw-Knox Company, Pittsburgh, Pa.
109. *Collapsible steel forms for concrete construction.* Interesting descriptive catalog.

METAL LATH—See Lath, Metal and Reinforcing

METALS

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.
111. *Reference Book.* Pocket Edition. 2½ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.
112. *Copper—Its Effect Upon Steel for Roofing Tin.* Catalog 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.
113. *Apollo and Apollo-Keystone Galvanized Sheets.* Catalog. 8½ x 11 in. 20 pp. Illustrated.
114. *Research in the Corrosion Resistance of Copper Steel.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.
115. *Facts Simply and Briefly Told.* Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.
116. *Black Sheets and Special Sheets.* Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights bundling tables, etc.
Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

N. & G. Taylor Co., Philadelphia, Pa.
117. *Booklet and Detail Sheet of Tin Roofing.* See Roofing.

METAL TRIM—See Doors, Windows and Trim, Metal

MILLWORK—See also Lumber—Building Construction—Doors and Windows

MORTAR—See also Cement

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.
118. *Clinton Mortar Colors.* Booklet. 3½ x 6¾ in. 8pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

MOULDINGS, METAL

National Metal Molding Co., 25 Fulton Building, Pittsburgh, Pa.
119. *Bulletins.* Bound in a standard correspondence folder, suitably indexed for convenient filing, describes complete line of metal moldings.
120. *Handbook for the Man on the Job.* An illustrated book of fittings and methods, with description and instructions for installing National Metal Molding under all conditions; a book meant to be conveniently carried and used on the job. Size 4¾ x 6 in. 102 pp.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Bird & Company, J. A. & W., 88 Pearl Street, Boston, Mass.
121. *Ripolin Specifications.* Booklet. 8 x 10½ in. 12 pp. Description. Contains twenty-one carefully prepared specifications for undercoats for different types of work.

S. C. Johnson & Son, Racine, Wis.
122. *The Proper Treatment for Floors, Woodwork and Furniture.* Booklet. 6¼ x 8⅜ in. 32 pp. Illustrated in color. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.
123. *Portfolio of Wood Panels.* 5½ x 10¾ in. 14 pp. A portfolio containing actual panels of finished woods. Also contains valuable information on finishing and re-finishing floors and woodwork.

National Lead Company, 111 Broadway, New York, N. Y.
124. *Handy Book on Painting.* Book. 5½ x 3¾ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal etc. both interior and exterior.
126. *Red Lead in Paste Form.* Booklet. 6¼ x 3½ in. 16 pp. Illustrated. Directions and formulas for painting metals.
127. *Came Lead.* Booklet. 8¼ x 6 in. 12 pp. Illustrated. Describes various styles of lead cames.
128. *Cinch Anchoring Specialties.* Booklet. 6 x 3½ in. 24 pp. Illustrated. Describes complete line of expansion bolts.
129. *That Magic Thing Called Color.* Booklet. 5½ x 8½ in. 24 pp. Illustrated. Short treatise on the use of color in the home, special reference to walls and ceilings.
130. *Architects' Specification Manual.* 8½ x 11 in. 50 pp. Complete specifications for all paint products.

Eugene E. Nice & Company, 268 South Second Street, Philadelphia, Pa.
125. *Price List "CO1"* contains descriptions of various paints, japans, varnishes, glue, stains, varnish remover, etc. 48 pp. Pocket size. Sent to any address.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
131. *Spread the Sunshine Inside.* Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories.

PARTITION SYSTEM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
133. *Loose leaf bulletins.* 8½ x 11 in. Jester-Sackett, consists of plaster board applied to metal channels with special clip, ready for plastering.

PARTITION TILE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
134. *Fireproof.* 32-page booklet, 8½ x 11 in., including description, specifications, and working details of Pyrobar partition tile.

PLASTER—(Interior)

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

PLASTER BOARD

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
135. *Pamphlets,* describes Sackett Plaster Board used instead of wood or metal lath.

PLUMBING SUPPLIES

Hardin-Lavins Co., 4538 Cottage Grove Avenue, Chicago, Ill.
Hess Warming & Ventilating Co., 1205D Tacoma Building, Chicago, Ill.
136. *Hess Sanitary Steel Medicine Cabinets.* Booklet. 4 x 6 in. 16 pp. Illustrated.

PUMPS

C. H. & E. Mfg. Co., Milwaukee, Wis.
Bulletin No. 2. Pumps.

The F. E. Myers & Bro. Co., Ashland, Ohio.
137. *General Catalog.* 6 x 9 in. 392 pages. Shows complete line of Myers Products—Pumps for Every Purpose, Hay Tools, Door Hangers, Store Ladders, etc. Of particular interest to hardware and implement dealers; plumbers, architects, contractors and builders; mill, mine, factory and railway superintendents and purchasing agents; highway contractors and builders.
138. *Catalogs.* 6 x 9 in. Devoted to separate lines: No. 55, Pump—Hand and Power Pumps; No. PP-55, Power Pumps; No. HT-55, Hay Tools, Door Hangers and Store Ladders; No. HP-22, Hydro-Pneumatic Pumps, Electric House Pumps, Direct Water Systems; No. SOP-21, Self-Oiling Power Pumps; No. MC-21, Cylinders and Working Barrels; No. SP-22, Spray Pumps and Spraying Accessories. All catalogs fully illustrated.

REFRIGERATION

McCray Refrigerator Co., 2264 Lake Street, Kendallville, Ind.

ROOF DECKS

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
139. *Loose leaf bulletins.* 8½ x 11. Describing Pyrobar Roof Tile, which is laid directly on purlins or tee irons, joints grouted, and is then ready for roof covering.

ROOFING MATERIALS

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.
American Sheet & Tin Plate Company, Pittsburgh, Pa.
140. *"Better Buildings."* Catalog. 8½ x 11. 32 pp. Describing Corrugated and Formed Sheet Steel Roofing and Siding Products—Black, Painted and Galvanized; together with directions for application of various patterns of Sheet Steel Roofing in various types of construction.

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
141. *Specifications and Price List.* Descriptive booklet. Details of Ambler Asbestos Cement Roofing Slates, "Century" Asbestos Shingles and Asbestos Corrugated Sheathings. Tables and drawings. Size 6 x 9 in. 44 pp.
142. *Ambler Asbestos Corrugated Roofing.* Catalog gives complete data for specifying, drawings, methods of application, tables, etc. Size 8½ x 11 in. 20 pp.

Wm. L. Barrell Co., of N. Y., Inc., 50 Leonard Street, New York.
143. *Prepared Canvas for Roofing.* Samples can be obtained on application. A canvas for every use.

Bird & Son, Inc., East Walpole, Mass.
144. *Makers of crushed slate asphalt roofing* in roll and shingle form.

John Boyle & Co., Inc., 112-114 Duane Street, New York, N. Y.
145. *Boyle's Bayonne Roof and Deck Cloth.* List B 93. A prepared roofing canvas guaranteed waterproof for decks and the roofs and floors of piazzas, sun-parlors, sleeping porches, etc.

Creo-Dipt Company, 1025 Oliver Street, North Tonawanda, N. Y.
153. *Standard Stained Shingle.* Samples of different kinds mailed on request.

Individuality, Beauty and Adaptability Account for its Growing Popularity

NOTE how well the illustrations demonstrate the attractiveness and practicability of Natco Double Shell Tile. The ample vertical and bed joints make it possible for the mason to spread on the mortar quickly and easily. The moisture stop at each end of the tile in combination with the double shell construction eliminates through mortar joints and prevents heat cold and moisture from penetrating through the walls.

Special tile in full and half lengths take care of lintels, sills, corners, window and door openings, joist and soldier courses, water-tables, etc., and readily adapt themselves to any distinctive architectural or decorative treatment.

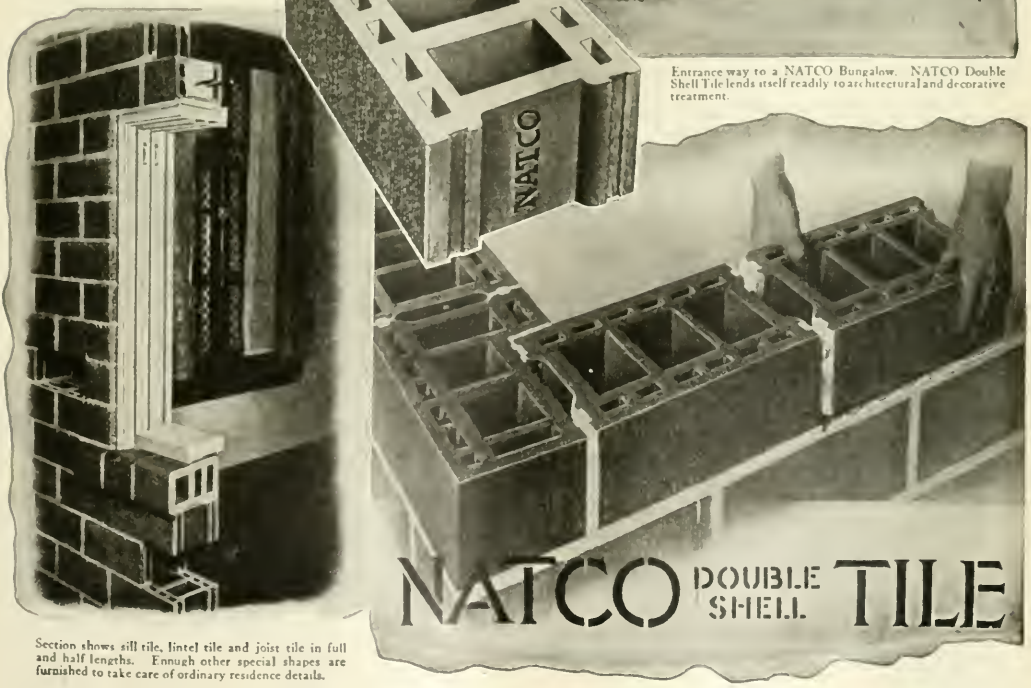
Write for further information about NATCO Double Shell Tile—a building material easy to lay and install, with every advantage of ordinary hollow tile construction coupled with a flexibility, beauty and lasting satisfaction found in no other material on the market today.

NATIONAL·FIRE·PROOFING
·COMPANY·

1429 Fulton Building
PITTSBURGH, PA.



Entrance way to a NATCO Bungalow. NATCO Double Shell Tile lends itself readily to architectural and decorative treatment.



Section shows sill tile, lintel tile and joist tile in full and half lengths. Enough other special shapes are furnished to take care of ordinary residence details.

NATCO DOUBLE SHELL TILE

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 72*

154. *Architectural Service Sheets.* 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.
Edwards Mfg. Co., 423 Eggleston Avenue, Cincinnati, Ohio.
C. G. Hussey & Co., Pittsburgh, Pa.
227. *Copper Roofing and Flashings.* Book No. 6. 34 pp.
Illinois Zinc Company, 280 Broadway, New York, N. Y.
155. *Pure Rolled Zinc.* (Corrugated and Plain Sheets.) Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Facts regarding adaptability of zinc for roofing. Specifications of corrugated zinc sheets. Weights per square. Comparative gauge lists
156. *The Roof That's Always New.* Booklet. 3½ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley, ridge and hip piece.
National Lead Co., 111 Broadway, New York, N. Y.
158. *Sheet Lead for Roofing.*
National Sheet Metal Roofing Co., 339 Grand St., Jersey City, N. J.
159. *Manufacturers of Metal Shingles* in various designs, both in painted tin or galvanized iron. Samples sent to interested parties.
Richardson Co., Lockland, Cincinnati, Ohio.
F. C. Sheldon Slate Co., Granville, N. Y.
N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.
160. *Selling Arguments for Tin Roofing.* Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.
United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
161. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins. 8½ x 11. Pyrofill.

RULES

A. S. Aloe, St. Louis, Mo.
Keuffel & Esser, Hoboken, N. J.
Kolesch & Co., 135 Fulton Street, New York City.
Sargent & Co., New Haven, Conn.
Stanley Rule & Level Co., New Britain, Conn.

SASH CORD

Samson Cordage Works, Boston, Mass.

SAW MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.
162. *Catalog No.* 21, describing Circular Saws of all sizes.
163. *General Catalog No.* 22 and *special Bulletin No.* 77, describing sawing machinery for use on the job in the shop.
W. F. & John Barnes Co., 71 Rudy Street, Rockford, Ill.
C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
164. *Bulletin No.* 1, *Saw Rigs.*
Crescent Machine Co., 206 Main Street, Leetonia, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N. Y.
C. E. Jennings Co., 321 Winthrop Avenue, New Haven, Conn.
Parks Ball Bearing Machine Co., Station A, Cincinnati, Ohio.
Sidney Machine Tool Co., Sidney, Ohio.

SCREENS

American Wire Fabrics Company, 208 South La Salle Street, Chicago, Ill.
165. *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enameled, galvanized, aluminoid, copper bronze. 30 pp. Illustrated. 3½ x 6¼ in.
Victor Parting Bead Co., Reading, Pa.
166. *"Victor Fly Screens."* 24 pp. Manual showing various types and methods of screening windows, doors, porches, etc., in all kinds of buildings.

SCREW HOLES

The Stines Screw Holes Co., Waterbury, Conn.
167. *A Four-Page Leaflet.* 8½ x 11 in., showing exact sizes with prices, for immediate delivery. Screw Holes are driven into a drilled hole with a hammer. When Driving Head is removed a permanent Brass Screw Hole is left.

SEWAGE DISPOSAL

Aten Sewage Disposal Co., 286 Fifth Avenue, New York, N. Y.
168. *Illustrated treatise* on the disposal of sewage according to the Aten System.

SHEATHING

Bird & Son, East Walpole, Mass.
Bisbopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
171. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.
The Brown Co., Portland, Me.
172. *Sample book of "Bermico" Sheathing Papers* sent to interested parties.
Porete Mfg. Co., 20 Verona Avenue, Newark, N. J.
United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.
173. *Eight-page Folder.* Describes Adamant Sheathing Board for use instead of wood sheathing.

SHINGLES—METAL

Cortright Metal Roofing Co., 50 North 23rd Street, Philadelphia, Pa.
174. *"Concerning That Roof."* A complete catalog describing and illustrating Cortright Metal Shingles and Trimmings. 7 x 10¼ in. 32 pp.

SLATE—See also Roofing

John D. Emack Co., 112 South 16th Street, Philadelphia, Pa.
Knickerbocker Slate Corp., 153 East 38th Street, New York, N. Y.
F. C. Sheldon Slate Company, Granville, N. Y.
175. *Commercial and Architectural-Roofing Slate* in all colors and textures. Also blackboards, structural and electrical slate. Slate Granules.

STAIRWAYS

Bessler Movable Stairway Co., Akron, Ohio.
169. *Illustrated catalog,* containing 24 pp., describes how the Bessler Movable Stairway saves floor space and adds an extra convenience to the home.

STANDARD BUILDINGS

Truscon Steel Co., Youngstown, Ohio.
176. *Truscon Standard Buildings.* Fourth Edition. Catalog. 8½ x 11 in. 40 pp Illustrated. Erection details, cross-section diagrams and adaptations are given.

STONE, BUILDING

Art Stone Co., Waynesboro, Pa.
170. *Descriptive circulars with illustrations* of different marbles in colors. Sent free to any interested party.

STORE FRONTS

J. W. Coulson Co., Columbus, Ohio.
Store Front Construction simplifies the problem for the builder and owner. It beautifies and enhances the value of store property. A special device prevents glass breaking.
Kawneer Co., Niles, Mich.
177. *Kawneer Store Front.* Illustrated catalog. Drawings and details of construction. Size 8½ x 11 in. 32 pp.
178. *Full Size Details Kawneer Construction.* Blue prints. Size 30 x 36 in.
179. *A Collection of Successful Designs.* Portfolio. Shows 24 typical store fronts with elevations. Size 9 x 12 in. 32 pp. Catalog B. J 8. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STRUCTURAL STEEL

National Pressed Steel Co., Massillon, Ohio.

STUCCO—See also Cement

American Materials Co., 101 Park Avenue, New York, N. Y.
The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.
182. *The Stucco House.* Contains many beautiful illustrations of houses finished with stucco and selected particularly for their architectural value. Detailed illustrations of stucco surface textures and drawings showing wall construction with revised specifications covering application of stucco. 96 pp. 8½ x 11 in. Price 50 cents.
180. *Guide to Good Stucco.* A book telling of the advantages of Portland Cement stucco, and how to apply it. Shows numerous finshes obtainable with ATLAS WHITE Portland Cement. 28 pages. 8½ x 11 in.
National Kellastone Company, 155 East Superior Street, Chicago, Ill.
183. *Specifications for Stucco Work.* A booklet containing complete specifications in detail for the use of Kellastone stucco for new buildings as well as the "overcoating" of old buildings. 13 sheets of text, 2 sheets of illustrations. 8 x 11 in.
184. *The Story of Kellastone Imperishable Stucco.* In this most interesting book the merits of Kellastone are set forth in a convincing manner. Every page contains pictures of beautiful houses stuccoed with Kellastone, and there are two pages in color. 22 pp. Illustrated. 8½ x 12 in.
Rocbond Co., Van Wert, Ohio.

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Avenue, Cincinnati, Ohio.
181. *Bishopric for All Time and Clime.* Catalog. 7½ x 11 in. 52 pp. Illustrated. Describing the use of Bisbopric Stucco and Plaster Base and Bishopric Sheatbing.

STUCCO-MAGNESITE—See Stucco

American Materials Company, 101 Park Avenue, New York, N. Y.; Weed Street and Sheffield Avenue, Chicago, Ill.
185. *Elastico, the Stucco of Permanent Beauty.* Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.
Natl. Kellastone Co., 155 East Superior St., Chicago, Ill.
United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

SURVEYORS' INSTRUMENTS—See Levels

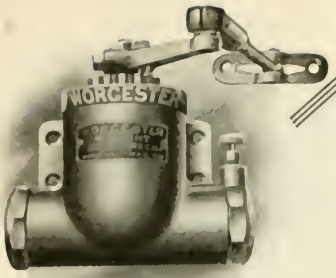
SUSPENDED CEILING

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.
186. *Loose-leaf Bulletins.* 8½ x 11. Jester-Saskett, consists of plaster board applied to metal channels with special clip, ready for plastering.

THERMOSTATS—See Heating Equipment

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Building, Chicago, Ill.
187. *Handbook of Hollow Building Tile Construction.* 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.
National Fire Proofing Co., 250 Federal Street, Pittsburgh, Pa.
188. *Standard Wall Construction Bulletin* 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.
189. *Industrial Housing Bulletin* 172. 8½ x 11 in. Illustrated. Photographs and floor plans of typical workingmen's homes.
190. *Natco on the Farm.* 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction
191. *Fireproof Buildings of Natco Hollow Tile.* Booklet. 8½ x 11.



The better the door—the better the reason for using

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Worcester Blount Door Check

They save wear and tear—eliminate slamming—prevent breakage—bring peace and quietness into home, office, and factory. Standard for 30 years—now offered with SEVEN improved features that make it the most satisfactory door closer on the market. Made in SIX MODELS—a style and size for every door. Be sure to specify "Worcester Blount Door Checks"—BEST—all ways.

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Park Production and Engineering Organization assure utmost in delivery and mechanical service.



Rev. W. T. Elsing's Residence, Lakewood, N. J.
Insulated with "Quilt," as per letter below:

De Witt Memorial Church, New York, March 10, 1908.

"I built a house last summer in which I used your Sheathing 'Quilt' under the shingles and also between studding. I sheathed all the rooms with half-inch tongued and grooved boards, and decorated the walls with sanitary and Japanese crepes. The result is, I have a cheaper, warmer and more beautiful house than I could possibly get by using laths and plaster."

W. T. ELSING.

Make Your Houses Frost-proof by insulating them with

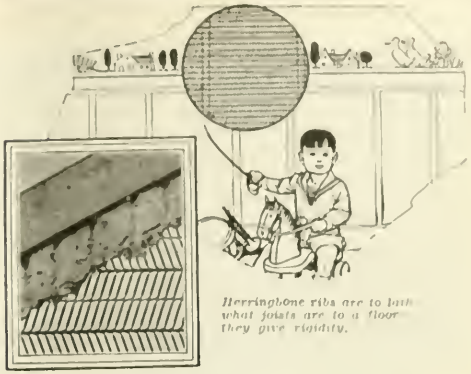
Cabot's "Quilt"

IT is cheaper to *build* warm houses than to heat cold ones. A cold house will *waste* enough coal in two winters to pay for enough Quilt to make it warm for all time. Quilt is not a mere building paper, but a thick, matted lining of cured eel-grass that is *twenty-eight times warmer than common papers*. It will make your house warm in winter and cool in summer, cut down your doctor's bills and keep the whole family comfortable. It will never rot or distintegrate—lasts forever—and is fire-retarding. A full investigation will cost you a postal card—which will bring you a sample and the proofs, with name of your nearest agent. Will you write now?

SAMUEL CABOT, Inc., Manfg. Chemists, Boston, Mass.

Also Cabot's Creosote Shingle Stains

342 Madison Ave., New York — 24 W. Kinzie St., Chicago



Herringbone ribs are to lath what joists are to a floor—they give rigidity.

Protects Bearing Walls from Fire

When *they* go the house goes. Construct your home with the bearing partitions protected with metal lath and plaster.

Herringbone spans sixteen inches. It is designed for standard stud spacing. Its use in a home means safety.

The increase in cost is but a small fraction of the increase in value.

Send for illustrated literature.

Herringbone
RIGID METAL LATH

The General Fireproofing Company

Youngstown, Ohio

BRANCHES:

Syracuse	Omaha	Milwaukee	Kansas City	Atlanta
Philadelphia	Boston	Baltimore	Cleveland	San Francisco
Chicago	New York		Minneapolis	Buffalo

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 74*

TOOLS

C. E. Jennings & Co., 321 Winthrop Avenue, New Haven, Conn.
Mack & Co., Rochester, N. Y.
North Bros. Mfg. Co., Lehigh Avenue, Philadelphia, Pa.
Progressive Mfg. Co., Torrington, Conn.
Sargent & Co., New Haven, Conn.
Stanley Works, New Britain, Conn.
James Swan & Co., Seymour, Conn.
The L. & I. J. White Co., Buffalo, N. Y.

TRACTORS

C. H. & E. Mfg. Co., Milwaukee, Wis.
Bulletin No. 4, Tractors.

TRAILERS

Rogers Bros. Co., Albion, Pa.

VENTILATION

Automatic Ventilator Co., 1003 Park Avenue, Baltimore, Md.
192. *Illustrated Folder.* Describes the construction and installation of an automatic ventilator which can be installed at the top or bottom of a window, either inside or outside.

Royal Ventilator Company, 415 Locust Street, Philadelphia, Pa.
193. *Descriptive Catalog* of round and rectangular ventilators made in galvanized iron, copper, etc. Illustrated.

E. G. Washburne Co., 207 Fulton Street, New York, N. Y.
194. *Illustrated Booklet* of metal ventilators, weather vanes, lightning rods, etc.

WALL BOARDS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
195. *Descriptive catalog and sample of Linobestos Wall Board* for interior construction. Flame-proof and fire-resisting wall board.

Beaver Board Co., Buffalo, N. Y.
196. *Illustrated folder,* describing various uses and the methods of handling Beaver Board to the best advantage. Samples with descriptive literature sent on application.

Bird & Son, East Walpole, Mass.
197. *Samples and descriptive catalog of Neponsit Wall Board* sent to interested parties.

Bishopric Mfg. Co., Cincinnati, Ohio.
198. *Booklet. "Bishopric for All Time and Clime."* Containing facts and figures, and illustrated with photographs of beautiful houses built with Bishopric stucco, plaster and sheathing units. Sent free.

Compo-Board Co., 5778 Lyndale Avenue, North, Minneapolis, Minn.
199. *Catalog sent on request with sample.* Describes many uses of Compo-Board.

McAndrews & Forbes, 200 Fifth Avenue, New York, N. Y.
200. *Folder.* Describing uses and application of Fiberlic Wall Board, together with sample of same sent to any address.

United States Gypsum Company, 205 West Monroe Street, Chicago. Ill
201. *Walls of Worth.* Booklet. 8½ x 11 n. 24 pp. Illustrated. Describes Sheetrock, the fireproof wall board, its advantages and uses.

WALL FURRING

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.
202. *Thirty-two-page Booklet.* 8½ x 11 in. Pyrobar. Tile.

WATER HEATER

Economy Heater Co., 108 South La Salle Street, Chicago, Ill.
Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.
Humphrey Company, Kalamazoo, Mich.

United States Ozone Co., Scottdale, Pa
203. *Bulletin. Ozone Water Sterilizers.* Contains description of principles and mechanical design, results obtained and specifications covering construction. Complete outline of operation. Capacities from 100 to 1,000 gallons per hour.
204. *Bulletin. Swimming Pools.* Description and application of Ozone Apparatus to Swimming Pools. This Bulletin completely covers the purification of swimming pool water and gives unique designs of swimming pool circulating systems.

WATERPROOFING—See also Dampproofing

Toch Brothers, 320 Fifth Avenue, New York, N. Y.
205. *Toxement.* Booklet. 5½ x 8½ in. Illustrated. 24 pp. Describes Toxement, an integral waterproofing compound for concrete, stucco, cement, mortar, etc.

Truscon Laboratories, The, Corner Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
206. *Science and Practice of Integrol Waterproofing.* Pocket size. 33 pp. Illustrated. Contains full specifications for waterproofing MASS Concrete, stucco and Cement Plaster Coat. Entire chapter devoted to "Practical Application of Waterproofed Cement Plaster Coat."
207. *Technical Pamphlet No. 8.* Booklet. 4 x 7 in. 28 pp. A discussion of why concrete requires waterproofing and the properties an integral waterproofing must possess to operate effectively with the natural properties of concrete.

WATER SUPPLY SYSTEM

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WEATHER STRIPS

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.
Diamond Metal Weatherstrip Co., Columbus, Ohio.
Monarch Metal Products Co., 5020-26 Penrose Street, St. Louis, Mo.
210. *Cause and Effect.* A series of pamphlets describing Monarch Metal Weather Strips, which are made of bronze, brass and zinc. They differ from all other strips in that they are applied in spaces around doors and windows as elastic fillers and not over the space as covers. Each 4 pp. 8½ x 11 in.

Victor Parting Bead Co., Reading, Pa.
209. *Through the Closed Window.* 12 pp. Treats of Victor Parting Bead as a modern stripping device. *How to Weather Strip Doors and Windows the Victor Way.* 32 pp. Complete instructions on how to install parting beads, and metal weather stripping.

WEATHER VANES

E. G. Washburne & Co., 207 Fulton Street, New York, N. Y.
211. *Descriptive Catalog in Colors.* Showing two different designs of weather vanes, lightning rods, ventilators, etc

WINDOWS—See Also Doors and Windows

Andersen Lumber Co., South Stillwater, Minn.
Hope & Sons, Henry, 103 Park Avenue, New York.
212. *Catalog.* 12¼ x 18½ in. 30 pp. Illustrated. Full size details of outward and inward opening casements.

WINDOW HARDWARE

The Kawneer Company, Niles, Mich.
213. *Kawneer Simplex Windows.* Catalog. 8½ x 10½ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installations in residences and buildings of all sorts.
214. *Detail Sheets and Installation Instructions.* Valuable for architects and builders.

National Mfg. Co., Sterling, Ill.
Pullman Mfg. Co., Rochester, N. Y.
Samson Cordage Works, Boston, Mass.
Catalog. 3½ x 6¼ in. 24 pp. Illustrated. Covers complete line.
Sargent & Co., New Haven, Conn.
Smith & Egge Mfg. Co., The, Bridgeport, Conn.
215. *Booklet.* 6¾ x 9 in. 42 pp. Illustrated. Covers a complete line of chains, hardware and specialties.

Stanley Works, New Britain, Conn.

WINDOW LEAD

National Lead Company, 111 Broadway, New York, N. Y.
216. *Lead Came Booklet.* A booklet illustrating various sizes of lead cames. 12 pp. 6 x 8½ in.

WIRE ROPE

Williamsport Wire Rope Co., 122 South Michigan Avenue, Chicago, Ill.

WOODWORKING MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.
217. *Contractors' Bulletin No. 77.* Describing various types of portable Variety Woodworkers. General catalog No. 22, describing a general line of woodworking machinery.

W. F. & John Barnes Co., 71 Rudy Street, Rockford, Ill.
218. *Catalog.* Containing description of rip and other machine saws, formers, mortises, tenoners, lathes. 38 pp. Illustrated.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
219. *Catalog* of portable saw rigs, pumps, compressors, engines, etc. 48 pp. Illustrated.

The Crescent Machine Co., 259 Main Street, Leetonia, Ohio.
220. *Catalog.* Describing band saws, shapers, jointers, planers, borers, mortises, etc. 144 pp. Pocket size. Illustrated.

Hutchinson Mfg. Co., Lafayette Street, Norristown, Pa.
221. *Illustrated descriptive circular* of portable woodworking machinery that you can take to the job, using it on a bench.

R. E. Kidder Co., 35 Hermon Street, Worcester, Mass.
222. *Catalog.* Describing improved boring machine and how it can be used.

Parks' Ball Bearing Machine Co., Sta. "A," Cincinnati, Ohio.
223. *Illustrated Folder.* Describing Parks' Planing Mill Special, comprising circular saw, jointer, band saw, shaper, borer, tenoner, etc.

Sidney Machine Tool Co., Sidney, Ohio.
224. *Catalog.* Containing description of various woodworking machinery. 96 pp. Pocket size.

J. D. Wallace & Co., 1401 Jackson Boulevard, Chicago, Ill.
225. *Bulletin No. 219-K.* Describes portable electric punch machines, tools, planers, jointers, circular saw, etc.

The Automatic Ventilator

"Makes Your Room Breathe"



NO DRAFT
NO NOISE
WEATHERPROOF
DURABLE
INEXPENSIVE

The Only Ventilator Built on a Positive Anti-Draft Principle

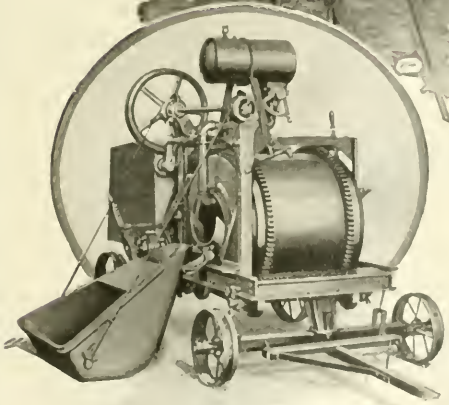
A style for every use—for homes, hotels, hospitals, offices, stores, clubs, factories, banks—wherever continual fresh air is wanted.

Write for Catalog.

The Automatic Ventilator Co., Inc.
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Sales Offices in Principal Cities

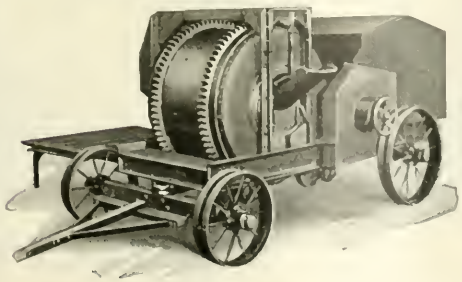


KOEHRING DANDIE MIXER



Koehring Dandie Capacities

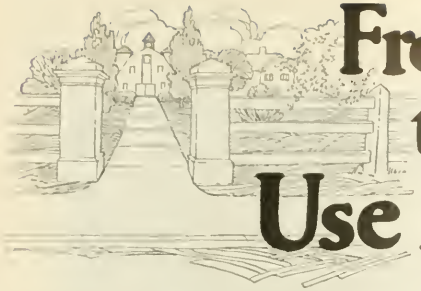
4 cu. ft. mixed concrete—gasoline. 7 cu. ft. mixed concrete—steam and gasoline. May be equipped with power charging skip, low charging platform, automatic water measuring tank, and light duty hoist



Don't mis-judge this mixer by it's price

It sells well within the price range for light mixers—and that is just where you may think it represents about the same value to be expected in mixers at that price. No! This is a light mixer of extraordinary dependability and long service. It is built in big quantities, every part standardized. That's what keeps quality up, and price down. It is Koehring engineered and Koehring constructed, the same as the big paving mixers, and big heavy duty construction mixers. ***Dependability*** is the greatest thing you can buy in a mixer—and here it is as it has never been before in a light mixer. You will save yourself money on many a job, if you will write for the Dandie Catalog Write today.

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MILWAUKEE WISCONSIN



From Gate Posts to Garage Use Alpha Cement

and give your customers the most substantial, permanent and economical improvements that can be built.

The cement dwelling below (drawn from a photograph of a house at Syracuse, N. Y., built by Hueber Bros.) is fire-safe as well as beautiful and comfortable.

A cement driveway keeps people out of the mud. A cement barn holds its value and keeps the farmer's stock clean and healthy. A cement silo is a fine investment for him.

See the Local ALPHA Dealer

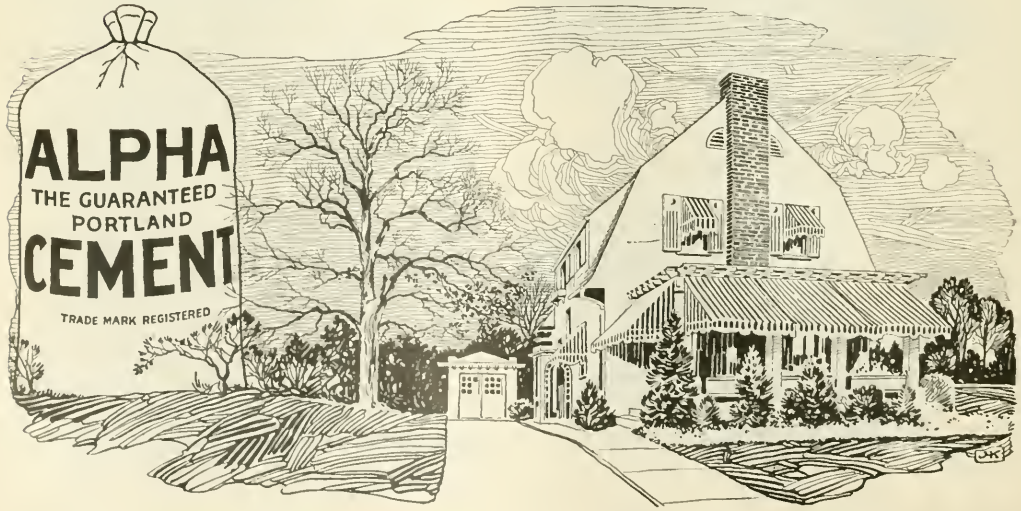
These and a score of other permanent improvements are described helpfully in the ALPHA CEMENT Construction Handbook, 104 pages, illustrated. Get a copy of this valuable book from the local ALPHA dealer and use it in your conferences with property-owners about their new buildings and improvements. If you don't know who the nearest ALPHA dealer is, write us, mentioning *Building Age*.

ALPHA PORTLAND CEMENT COMPANY

Easton, Pa. **140 S. Dearborn St., Chicago, Ill.**

New York **Boston** **Philadelphia** **Pittsburgh** **Baltimore**
Battle Creek, Mich. **Ironton, Ohio**

Plants at: Alpha, N. J. Martins Creek, Pa. Cementon, N. Y. Jamesville, N. Y.
Manheim, W. Va. La Salle, Ill. Ironton, Ohio Bellevue, Mich.





Why MAPLE outwears STONE

Every shoe in the thousands that strike a stone sill, grinds off its toll of fine particles in an unchanging friction. But Maple builds up its own resistance to wear, because each passing foot increases the polish on this hard-fibred, tight-grained wood, making it smoother and smoother.

That is why Maple surpasses all other woods and all other materials for flooring. Because of its individual characteristics, Maple is used for floors in every good home, office, school, church, apartment, public or industrial building.

Architects, engineers, contractors, builders—all who desire to give their clients the finest of counsel and service, will say "Floor with Maple." Wherever wear is essential or beauty desired, it is the wood to choose. And to be sure of the grade and quality you should have, see that it is flooring produced and guaranteed according to the rigid inspection standards of the Maple Flooring Manufacturers Association.

MFMA flooring is made from the climate-hardened, slow-growth Maple of Michigan and Wisconsin—the source of the world's finest Maple for floors.

Kindred woods of Maple are Beech and Birch, produced by the same high manufacturing standards. This trio of flooring woods offers a variety and versatility of surface finish which will satisfy any client you may have.

MAPLE FLOORING MANUFACTURERS ASSN.
1055 Stock Exchange Building, *Chicago*

The letters **MFMA** on Maple, Beech or Birch flooring signify that the flooring is standardized and guaranteed by the Maple Flooring Manufacturers Association, whose members must attain and maintain the highest standards of manufacture and adhere to manufacturing rules which economically conserve every particle of this remarkable wood. The trademark is for your protection. Look for it on the flooring you buy.

MFMA

Floor *with* Maple



THIS is one of the many Ideal wall homes built in Alton, Ill. The Alton Brick Company increased the amount of brick used in home building by 1000%.

This Trade-Mark stands for—

Quality—
An honest product, honestly advertised.

Responsibility—
A reputation for honorable, prompt and efficient business dealings.

Service—
A material of proven integrity with a record of ages of service.

The Common Brick Industry *of* America
1308 SCHOFIELD BUILDING
Cleveland, Ohio

400,000 Brick Used Where Only 40,000 Would Have Been Used

Here is just one example from many hundreds we can show you. What has happened in Alton is happening all over the country.

"Common Brick Mfrs. Assn.
Cleveland, Ohio

Gentlemen:

We are enclosing herewith photographs of some of the buildings that we now have under way using the Ideal wall. We have been able to get this construction in almost every type of building.

The best part about this is that all of these buildings would have been frame had we not gotten after the job. You will note all but two have brick foundations. We think in the future we will be able to get the foundation under all the houses. We find the 12½-inch brick wall can be extended to a 14-inch wall, without using any more brick, labor or mortar. This gives two larger air spaces and makes a most excellent foundation wall.

Very truly yours,
ALTON BRICK COMPANY
(*Signed*) Eben Rodgers, *President*"

The kind of buildings that Mr. Rodgers had been putting up range from a small private garage to bungalows, fine two-story houses, and store buildings. Not only are the walls built of eight-inch Ideal All-Rolok walls, but all of the buildings except two rest upon fourteen-inch Ideal foundation walls. These are the first jobs done in Alton in years in which brick has been used in the foundation.

This Book Thoroughly Describes Ideal Wall Construction

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SERVICE

No 4

BUILDING AGE

AND

THE BUILDERS' JOURNAL

NEW YORK, APRIL, 1922



BUILDING *OUR* HOME

PERHAPS at no other time in the history of our country has there been such a demand for houses as exists at the present time. The high rents, overcrowding, etc., due to the housing shortage created by the war, has made many people want a home of their own who would otherwise never have given it thought.

Bad as the housing cloud was, it had its silver lining and it is now being revealed in the wide interest taken in the possibility of owning a home.

The building of a home is a family affair; it is "Our Home" with all members of a real family. On the different pages of this issue the intending home owners will find many suggestions and practical hints that they can make use of when building their home, so that it will be more comfortable and attractive.



A Flower-Bordered Path Leading to An Inviting Front Doorway, Speaks Welcome to the Owners and Guests. Truly, "There is No Place Like Home"

As an indication of the widespread interest in home building, we need only refer to the large Own Your Home Expositions being conducted this month in Chicago, Cleveland, and New York, etc.

A great responsibility rests on the building contractors and architects of America to meet the demands for better standards of homes—we know they are able and willing to give real service to home builders.

The days when one watched the cellar being dug, the foundation being laid, the walls, floors, roof, etc., being placed, will always be remembered with pleasure. There are but few things in life more interesting than the pleasant adventure of Building Our Home.

Will the House Architect's



The House as Pictured by the Architect

WILL our house, when it is built, look like the sketch? This is a question which is put to builders and architects by practically every intending home builder. Most people are unable to visualize a house from the plans or even a perspective sketch; they do not know whether it will be carried out in the same way.

The pictures presented in this article illustrate how two houses have been built and they show conclusively that, with the exception of a few minor details, the houses look like the architect's sketches.

In the first sketch is shown the preliminary plans of a house for Mr. H. A. Rice, which was built at Malba, Long Island, New York. These were prepared by H. P. Knowles, a New York architect, for the Malba Estates Corporation, who were the builders.

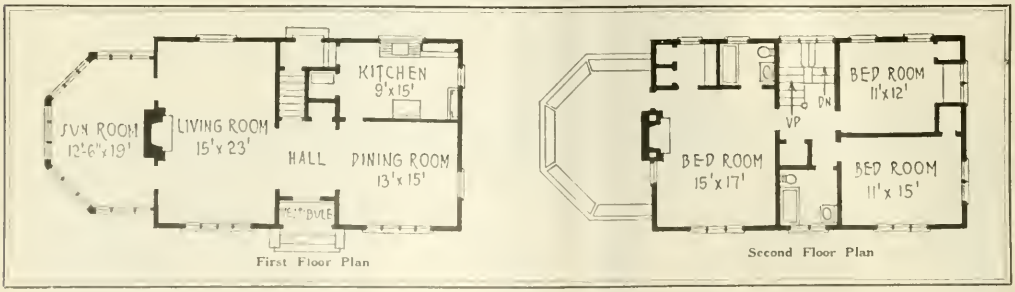
It is interesting to make comparisons and note the few changes that have been made. On the second floor the triple casement window has been changed to two single windows. Likewise, gable windows have been placed in the attic. In this case, two additional bedrooms and a bathroom were placed in this attic. The picture of the completed house has awnings on the first floor, which hide the casement windows of the sun parlor quite a good deal, but they are identical with those shown on the sketch.

The second sketch was also prepared by the same architect and erected by the same builders. The actual photograph of this house shows that a change has been made in the front entry porch. A little extra ornamentation has been placed here, but in our opinion the architect's original sketch should have been followed, as the result would have been better.

Another change was made in the porch; an open porch was designed with flower boxes on the floor to serve as a rail, but for screening-in purposes the owners thought it advisable to use a bulkhead instead of the flower boxes. This has been arranged for screens for summer and sash for



The House Built and Occupied



First Floor Plan

Second Floor Plan

Look Like the Drawings?



The Sketch Prepared by the Architect

winter use. An entrance to this porch was also made in the centre space, which leads out to the garden.

Outside of these minor changes the plan has been faithfully followed and the house looks practically the same as the architect's sketch.

It is quite interesting to study both these houses and to see how every little detail was carried out. It shows that if a set of plans are followed the result will be exactly as sketched.

In the sketch and photo of the second house there is quite an innovation in the use of glass for the sides or cheeks of the dormers; this has the advantage of doing away with the tunnel-like effect to these dormers from the inside rooms. This gives light in the attic rooms. The same idea has been carried out by Mr. Ernest Flagg, the noted New York architect, in some small houses that he has designed and he is enthusiastic about the advantages gained.

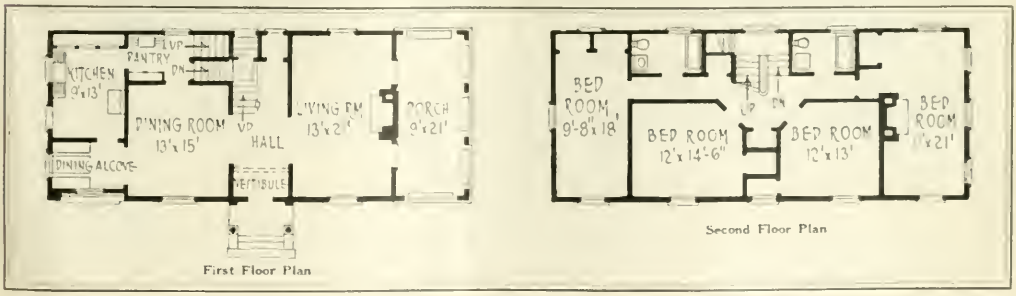
In some cases a model is made of the house so as to give the intending home builder an idea of exactly how the house is going to look. Quite often no perspective sketch is made, only plans and elevations. In this case one gets a rather poor idea of how the house will appear unless he has been trained by examining a number of houses under construction and their plans.

The most troublesome part of looking at an elevation of a house is the roof, this always looks very steep and top-heavy on the plans. When it is erected, however, the slant of the roof makes all the difference.

To obtain the correct proportion is a matter of experience only and it is safe to leave this to the architect rather than say it is too high and then have a flat looking roof. Should there be any doubt about whether a roof is too steep or too flat, simply have a small model made of the roof so that the proportions can be judged. It can be cut out of stiff paper and pasted together. It gives one an accurate idea of just how the roof is going to look.



How the House Appears When Erected



First Floor Plan

Second Floor Plan

Modern Cottage

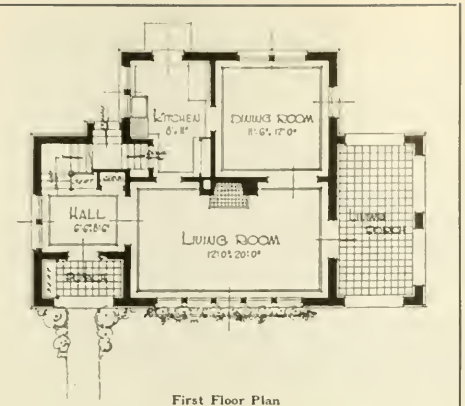
Six Room House Specially Designed for Building Age and The Builders' Journal

By R. C. HUNTER & BRO., Architects

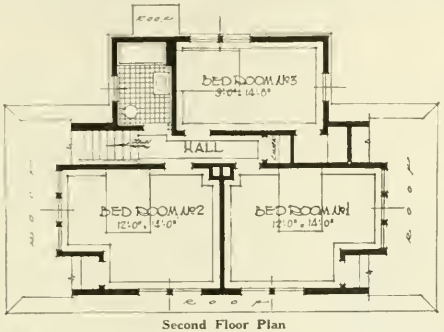
SLOPING lines to the roof of this house add a certain distinctiveness to its design. This feature roof gives a very unique and pleasing appearance, as it comes down and extends as a wide hood across the entire front of the house just above the first story windows, a strong horizontal effect is obtained that tends to lower the height and increases the apparent length of the house.

This gives a front of good proportions that is not stilted and in no way suggestive of the four-wall-and-roof "box" that is so often characteristic of small two-story houses.

To further the pleasing horizontal effect the windows are arranged in groups, symmetrically placed. Most striking is the group of five large windows in the first



First Floor Plan



Second Floor Plan

story that centers in the living room opposite the fireplace, giving a most unusual wall treatment and making the room bright and attractive.

A flower box extends the full length under this group of windows, offering a tempting setting for geraniums and hanging vines, where they will show to best advantage, both from within and without.

The first story walls are of stucco on hollow tile, giving a most effective background for planting and lending a variety to the exterior in the contrast of both color and texture that the plain wall affords, in relation to the shingle walls and roof above.

One enters the house through a little porch that has an inviting seat, into a small square reception hall. The living room opens up well from the hall and the stairs are so placed as to give the greatest service with no lost space.

A dining room, kitchen and an attractive living porch complete the first floor. This porch has a cement floor and the openings are so arranged that the enclosing of the porch in the winter months is a most simple matter, giving another room that is delightful to live in.

On the second floor are three good size bedrooms and a bath. Closet space is not lacking. All of the bedrooms have group windows that give plenty of air and sunshine, making these rooms comfortable and cheerful, just what bedrooms should be.

As figured here this house would cost about $8,000 to build; this is a fair estimate for reasonably good construction throughout.

Complete working plans and specifications of this house in blueprint form will be furnished for a nominal sum by BUILDING AGE *and* THE BUILDERS' JOURNAL.

Quantity Survey

of Modern Cottage Design Shown on Preceding Page

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc. Minor outs have been disregarded.

SUCH items as clearing site, temporary work and protection, scaffolding and general equipment and supplies, have not been included. Such items as are marked "Unit," are to be estimated in a lump sum, following requirements of plans and specifications.

EXCAVATION

(Excavation for pipe trenches not included)

Excavation for cellar	216	cu yds
Excavation for footings	18	cu. yds
Excavation for areas	6	cu. yds
Excavation for trench walls	12	cu. yds
Excavation for leader drains and dry wells	11	cu. yds
Backfilling around walls, etc	45	cu. yds
Leader drains and dry wells—		
Field stone for dry wells	6	cu. yds
4" salt glazed tile drain pipe	30	lin. ft
4" elbows	7	

MASONRY

Concrete Work—		
Concrete for cellar walls	710	cu. ft
Concrete for footings	310	cu. ft
Concrete for trench walls	180	cu. ft
Concrete for area walls	38	cu. ft
Cellar floor (3" concrete and 1" cement finish)	600	sq. ft
Area bottoms (brick and sand)	35	sq. ft
Porch floors (12" cinders, 3" conc. and 1" cement finish, colored and blocked off)	200	sq. ft
Concrete forms	2,400	sq. ft
Rienf. conc. window lintels—		
Concrete	160	cu. ft
⅜" sq. steel rods, 4' 0" long	6	
8' 0" long	2	
Pointing cellar window sills	18	lin. ft

HOLLOW TILE

8" x 12" x 12" block ...(or 780 blocks)	815	sq ft
4" x 12" x 12" block for corners	60	blocks
8" jamb blocks	50	
1" leveling slab	30	

BRICK WORK

Common brick work for chimney.(or 7 M.)	355	cu. ft
3" bluestone chimney caps 2'O" x 4'O"	1	Unit
Face frick for sills, etc.	380	brick
Face brick for fireplace hearth and jambs.. (or 112 brick)	16	sq. ft
Fire brick for fireplace..(or 100 brick)	20	sq. ft
8" x 12" T. C. flue lining	60	lin. ft

MASON'S IRON WORK

Fireplace damper (3'O" opg. with throat, etc.)	1	Unit
C. I. ash dumps	1	Unit
C. I. cleanout door for ash pit, (16" x 12")	1	Unit
C. I. cleanout door for boiler flue (8" x 8")	1	Unit
Thimble for boiler flue (9" dia.)	1	Unit
Anchor bolts for wall plate (¾" dia x 24" long with 4" washer and nut)	30	

PLASTERING

Three coat patent plaster on wood lath, gross	380	sq. yds
(Net 328 sq. yds.)		
Three coat patent plaster on hollow tile, gross	96	sq. yds.
(Net 60 sq. yds.)		
Keene's cement plaster on metal lath—		
Behind kitchen range	3	sq. yds
Keene's cement cap	10	lin. ft
Dampproofing under stucco—Net	1,500	sq. ft
Stucco on hollow tile, etc., gross	220	sq. yds
(Net 150 sq. yds.)		
Stucco on metal lath (net)	16	sq. yds
Cast concrete brackets for flower boxes	4	Units
G. I. corner beads	80	lin. ft

TILE WORK

Tile work for bath room—		
Floor (1" hex. white)	35	sq. ft
Wainscot (3" x 6" white wall tile)	132	sq. ft
6" base	15	lin. ft
Cap	27	lin. ft

SHEET METAL WORK

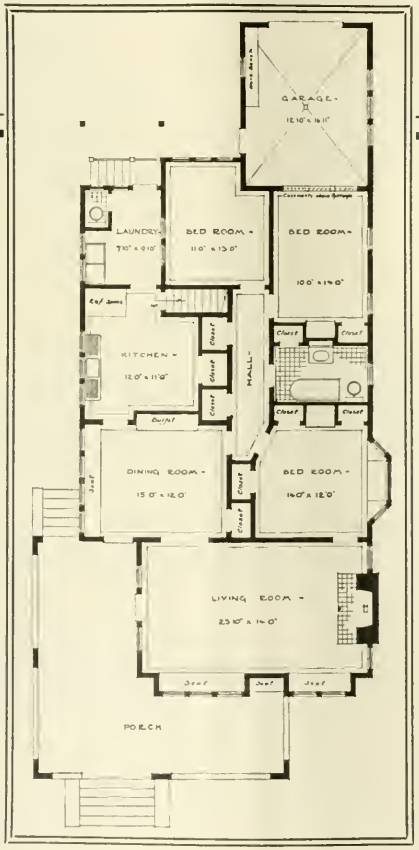
Tin roof on dormers	192	sq. ft
Tin flashings for roofs, etc	15	lin. ft
Tin flashing and counter flashing for chimney, etc	12	lin. ft
4" half round hanging gutter (galvanized iron)	204	lin. ft
3" x 4" G. I. leaders	65	lin. ft
Bends for same	11	
Ornamental heads	2	
Gutter thimbles	6	
3" x 4" G. I. gas range vent	22	lin. ft
Cap and thimble for same	1	

(Continued on page 54)



Riverside Bungalow

Novel House Plan with Front Facing Towards the River



WHERE the property is located that the best view can be had towards the rear, it is only common sense to plan the house so as to reap the benefit of this advantage of location. In the bungalow shown on these two pages this has been done. What is practically the rear of the house faces the street and the living room, with its adjoining large porch, faces towards the river.

This bungalow is the home of Mr. Amos Birdsell, and is located at Tom's River, N. J. It was erected from plans prepared by Heacock & Hokanson, architects of Philadelphia.

One enters the grounds from the street through an attractive pergola gate flanked on each side with a privet hedge along the street. A concrete walk extends down towards the river and parallel with it adjoining the front porch steps.

As will be noticed, there are steps leading into the rear entrance so that access can be had to the kitchen and also steps on the side leading to the main porch, from which one can enter the dining room or living room.

A garage is made part of the house and the design has been skillfully handled so as to give a pleasing exterior from the street side.

The construction of the house is frame covered with stucco, at the ground level there is a soldier course of red brick which gives just a little touch of color that is attractive. All the outside woodwork and trim is stained brown, also the roof shingles.

It will be noticed that the roof of the garage is flat. This enables the adjoining bedroom to have windows above the garage roof.

The service entrance is screened from the street by an ornamental latticed pergola. This in time will be covered by vines which will give all the privacy desired to the rear of the house, which in this case, faces the street.

The interior of the house has been very conveniently laid out. The feature that will attract one the most is the large amount of closet room. There is ample space for storing away things, which is so desirable in every household. This bungalow although designed for summer use, is a good type for the all-year round house.

The bedrooms are all off to one side and convenient to the bathroom. The living room is a large 14x24 foot room with two bay windows facing the river. Each of these bays has a window seat. It will also be noted that the space between the bays on the porch is utilized for a seat. A large open fireplace in the living room is an interesting feature. The ceiling of this living room is covered with heavy appearing built up beams, the spaces in between being filled with wall board.

In fact, the entire house has walls and ceilings covered with wall board and from the few pictures we show



View of Dining Room from the Living Room Showing Built-In Buffet

Below is View of Bedroom, Showing Built-In Chiffonier and Dressing Table.



it has been effectively handled. The dining room ceiling is also paneled off in beam effect. Note particularly the paneling in this dining room, it extends up to the height of the top of the door and the window casing which is continued all around the room. The walls in this paneled space are covered with a wood grained surface wall board over which the casing and panel strips are nailed.

In the picture of the dining room, note particularly the built-in buffet. It is of ample size and has an attractive double china closet above with small diamond shape divisions in the doors.

The kitchen is of good size with the sink conveniently placed, underneath the triple window so that ample light will be secured. Next to the kitchen, and serving as an entry porch, is the laundry; the tubs are placed under the double window with sufficient space at the end for washing machine, etc. A small toilet room here is a convenience which will be appreciated at this end of the house.

Beautiful Home Convenient

Artistic Design Selected to Be Built as Full Size Model of Ideal Home at the New York Own Your Own Home Exposition

EVERYONE has a dream house tucked away in the corner of his mind—a hazy conception of the kind of place he would like to live in—flooded with sunlight and swept by fresh, clean air," said Dwight James Baum, designer of the *Beautiful Home Convenient,* the full size house to be erected on the floor of the 69th Regiment Armory, New York City, where the Fourth Annual "Own Your Home" Exposition will open April 22nd and continue until April 30th.

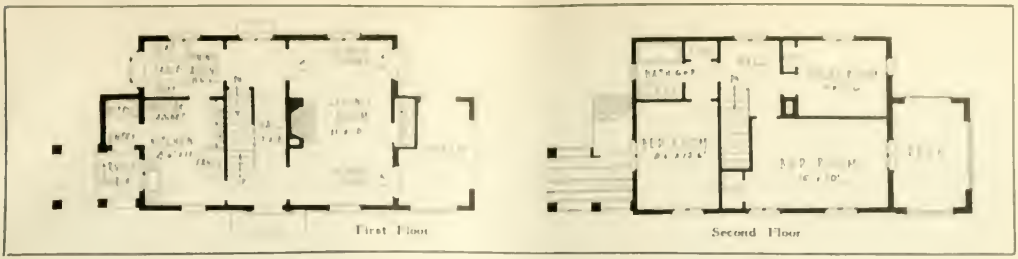


The committee in charge of the various divisions on the Exposition floor decided early in the fall that though it was necessary for exhibitors to display their products and give out information from individual booths, an unusual appeal could be made to the visiting public if we could visualize the ideal home, every phase of which must combine economy with good taste. The *Beautiful Home Convenient* does not represent any one interest. The building material manufacturers, the home furnishers, decorators, landscape gardeners, and many other manufacturers, contractors, and dealers are co-operating on making this house most complete. The idea is to want the public attending the Exposition to be so fired with a desire to own a home so that they will carefully take up the different details of construction and equipping their "dream house."

One of the most popular types of small houses today is the straightforward houses founded on the precedent of the small villas in northern Italy. These houses give the utmost space for they are usually economical in plan with a minimum of space lost, due to simple roof construction and other ways where space is lost.

The detail is very simple, the amount of ornament is cut down to a minimum and the structural members can be simplified because of these straight lines and roof construction. On account of the foregoing the Italian type was the one selected as the best suited to the desires of the committees co-operating on the building of the *Beautiful Home Convenient.*

The exterior is to be of creamy pink stucco with an entrance feature of artificial stone made to represent the warm colored Italian travertine stone. Over the main entrance there is a simple iron railing forming a small balcony from the owner's bedroom. This can be made most attractive by setting red flower pots in this space with geraniums and English ivy planted in them. All of the outside trim of the house, such as the window frames, the wood spindle grille and the gateway is to be painted a grayish apple green. The heavy shutters will be painted a purplish blue, giving a couple of interesting spots of color to the simple elevation. At the end of the house, the porch continues as part of the main building with concealed flower boxes back of the simple parapet wall, here geraniums and English ivy also give a color touch to the straight elevation. The vines falling down break up the otherwise severe lines



of the top. The roof is to be of red and brown tiles slightly irregular in both color and texture.

As one enters the hall, one gets a vista to the right into a rather large living room for so small a house. This room is 13 feet by 20 feet six inches with an open fireplace large enough for burning 3 feet 6 inch logs. The room has three exposures, one leading to a good sized porch, the other wall has an entrance to the rear hall and dining alcove through glass French doors. From the hall one goes up a straight stairs to three bedrooms and bath above, which are economically arranged, there being no corridors or broken off corners in any of the rooms.

The service end of the house is entered through a pergola on the left and from there to an entry where there is space for a refrigerator. The kitchen is entered from the latter room and is 10 feet by 13 feet in size, all economically arranged so that the housekeeper is saved many steps. There is a large built-in kitchen dresser, a generous sized sink and drain board, provision for a large kitchen range and for an extra portable cabinet which is universally used today in small houses. From the kitchen the housekeeper can serve direct to the dining alcove or answer the front door bell without going through any other room.

The dining alcove is a glorified pullman dining seat which has in this case two built-in benches with a table between, with an attractive bay window at the end, with electric outlets for attaching toaster and other such labor saving devices, which make living more comfortable. A window at the rear gives cross ventilation to this room. Between this alcove and the living room there is a hall which serves as entrance to the garden as well as to the rooms and to the basement.

Provision will be made for many labor saving devices as the house will be piped for gas and wired for electricity and plenty of base plugs will be used for reading lamps, table lamps, heaters, etc.

Included is a semi-detached laundry located at the rear of the house and this room will be fitted with the latest and most approved washing machine, drying machine, ironing machine and water heater.

From the living room at the side of the porch there is space for one of the new patent in-a-door beds, which makes it possible to care for an unexpected guest.

Mr. Baum, who is chairman of the Architectural Committee of the "Own Your Home" Exposition, is a specialist in the designing of country houses, and he has striven to make the "Beautiful Home Convenient" in every way, the Ideal American home.



This Bed Makes Another Room Unnecessary

In the building of this house, which must be accomplished in a few days, the exposition management will furnish and build all the framework and the various exhibitors will finish and furnish it complete with their products.

The outside walls will be of stucco on metal lath, the inside walls to be covered with wall board. Tile will be used for kitchen and entry floor. Fibre tile has been selected for the breakfast room and rear hall. The porch floor will be of 12x12 inch tile.

The living room and hall will have wall paper on walls and ceilings; the dining nook and kitchen are to be painted.

The first flower of spring, the early spring violet, will be the official flower of the Exposition. A new and elaborate installation of unusual color and design, predominating in violet, green and yellow hues is set up on the floor of the Coliseum at Chicago. The hundreds of exhibits will be shipped to New York at the closing of Chicago's Second Annual Exposition on April 2nd.

An exhibit of work of several of the best known country house architects will be selected by Harvey Corbett, who is to act as judge on the designs submitted to the Architectural Committee. Several of the better known architects have already accepted and it is the intention of the Committee to show the works of eight men. This will form a small architectural exhibit along one line of work which has not been done at any similar exposition. The prize winning design will be published in the May issue of Building Age and The Builders Journal.

Stone Church Design

Attractive Stone Structure in English Parish Style

CHURCH buildings have always been the subjects for the best architectural and building craftsmanship that could be obtained. The plans and photograph on these pages show a dignified example of church architecture, this is the Huguenot Memorial Church, built at Pelham, N. Y., erected after plans prepared by Francis A. Nelson, Architect, New York, and erected by Henry J. Brown & Son, builders, of Brooklyn, N. Y.

This church building in general character and arrangement conforms with the parish churches of England, which are known for their simplicity and charm. The more modest type has been selected as a model so as to comply with the funds available. This type permits of keeping the side walls low and no clerestory nor inside piers are employed, which arrangements enables every sitter to have a clear unobstructed view of the pulpit, as there are no intervening piers.

The high roof is supported by exposed trusses which rely for their decorative effect on the structural members themselves. The actual rafters are exposed and the roofing slate, is laid directly on the dressed sheathing; this form of roof calls for no expensive forms or boxing. The woodwork is stained a deep warm brown, which contrasts agreeably with the stonework of the walls and window trim. At the back of the church is the Narthex with which are connected three entrances.

The belfry tower joins the two buildings and serves as an entrance to the church, the Sunday school, the Bible classrooms and the Pastor's study, which are all on the ground floor and to the organ loft above. Special entrances are provided for the Sunday school and with its pleasant situation and outlook its use will be found advantageous for many social purposes. The assembly room follows the usual arrangement.

The main walls of the church and tower are constructed of local rubble stone, laid in white cement mortar joints, obtaining a very decorative effect. The trim is of cast stone approaching Indiana limestone. Copper is used for the flashings, gutters and leaders.

The floors in the aisles and vestibules of the church are of oak, the other floors of North Carolina pine.

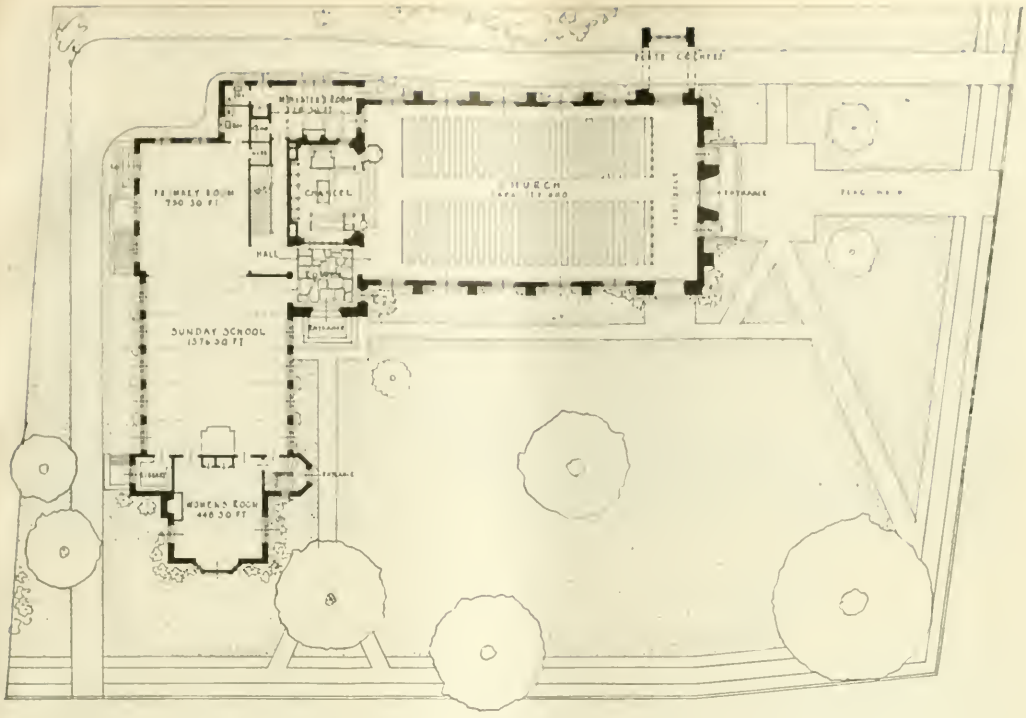
The roof trusses and sheathing are of yellow pine and the rafters of spruce, all dressed and stained a uniform brown, the trim is of cypress but in the service portion North Carolina pine is used.

The furniture is of oak and simple in character, the pews having built up boxed ends, pegged together. The windows are metal casements with leaded cathedral glass of three shades.

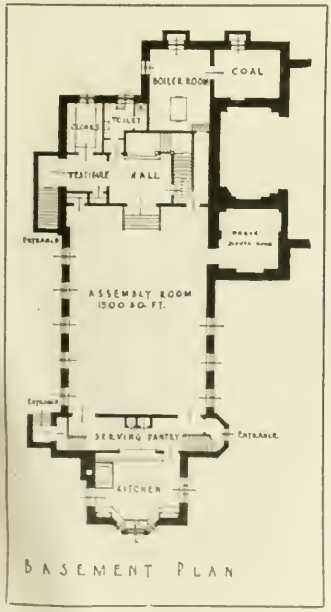
When building a stone structure there are several important points to be considered, and the following hints will be useful. They were written by I. P. Hicks for his "Builder's Guide":

A skilled stone mason endeavors to finish each course of rubble work as nearly level as the shape of the stones will permit unless he has stones in view to fit certain angles, and which are of such form that they will not slip after they have been laid. Three-cornered stones are the pet aversion of the mason, and are usually discarded if they cannot be used as fillers in places where they carry little or no weight. A stone covered with dry or loose earth should be brushed or washed clean before mortar is applied, as the earth will absorb the moisture of the mortar and prevent its contact with the surface of the stone.



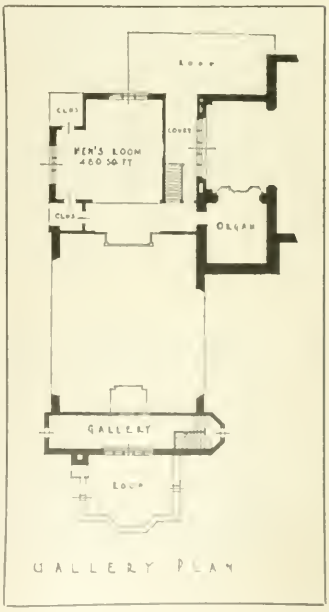


Plan of the Hugenot Memorial Church, Pelham, N. Y., and the Layout of the Grounds



The stability of a rubble wall depends upon the willingness of the stone mason to apply an axiom of his craft: "No matter what the size or shape of the space to be filled there is somewhere a stone to fill it." If the mason decided it will be wiser to trim a stone to fit the place than to spend the time necessary to find a stone which will just fit, the use of the hammer and chisel will trim corners off here and there. A stone which, to the unpracticed eye, appears hopeless will slip into its place easily.

A well-laid rubble wall should give the impression that its face is straight; small depressions or projections of the faces of single stones should not be considered. If several stones are so laid that there is a distinct depression or projected area in an otherwise straight wall it is evidence of poor workmanship. If joints are not of uniform width it is evident that the mason slighted the fitting of the stone. As stone is stronger than mortar the greater proportion of well fitted stone the better the wall.





Attractive Canadian Home

Designed by J. A. THATCHER, Architect, Toronto

THE substantial and attractive looking home shown above is the residence of Mr. Marshall G. Flick. It is situated on Wells Hill Avenue, Toronto, Ont., Canada.

The house is practically of brick construction. Stone is used as an ornamental base for the brickwork. The face brick used is light buff Hilton pressed brick.

The second floor gables are also of brick and this is stuccoed over. The roof is covered with dark red Spanish tile. The steps and path, also automobile driveway are of concrete.

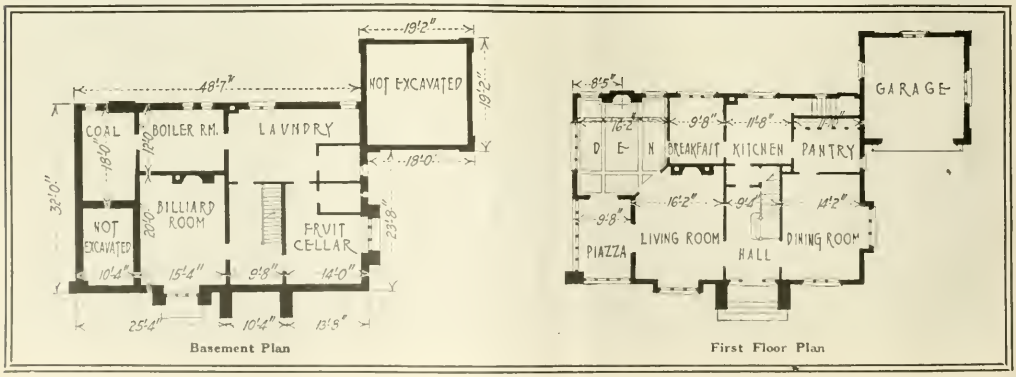
The treatment of the garage is rather unusual; it is linked with the house in a very attractive manner.

The floor plans presented herewith show how conveniently the rooms have been arranged. The dining room is finished in mahogany and, as our illustration shows, is paneled to a heighth of 6 feet, the walls above the paneling also ceiling are covered with canvas and painted with a frieze of conventional design.

The living room walls are paneled off in the frames, the woodwork in this room is of birch which has been finished in white enamel; the walls have been painted a putty shade, which serves as an effective background for the pictures and ornamental candelabra chandeliers.

From the living room one has a glimpse of both the den and sun parlor. The den is finished in gum wood with a beamed ceiling and is stained light walnut, when treated this way gum wood resembles Circassian walnut. The sun room is trimmed in birch and finished with a light French gray enamel, the floor is of 6 x 6 inch red quarry tile.

On the second floor the bedrooms have all been finished in popular en-



ameled white. The bathroom wall to a heighth of 6 feet is covered with 3 x 6 inch white glazed tile, the floor being of 1-inch hexagonal white ceramic tile.

But little attention is usually paid to our cellars. In this house a large billiard room occupies a considerable portion of the space. The ceiling of the entire cellar or basement is lathed and plastered. The stairway to this basement is a regular staircase, finished in mahogany and white so as to be an attractive feature. The wood trim in this basement is all finished in white enamel, and it certainly makes a very handsome appearance. The basement also contains a built-in wine cellar, which we understand the owner will keep well guarded when he receives American visitors—they are apt to think that all of the beauty of the house is in the cellar!



View of Dining Room, Showing the Mahogany Panelling

FACE brick may be used in three possible ways, determined by the backing-up material employed. First there is the solid brick wall consisting of common brick backing with a face brick front. Of the strength, permanence and structural value of this construction, there can be no question. The cost is more than a frame house, to be sure, but some people prefer this mode of construction. On account of saving in painting, etc., some claim there is an actual economy in using the more expensive material.

Some object to a brick wall on account of dampness, but this can be easily overcome. The mortar joints sometimes absorb moisture and so does a porous brick and frequently there is sweating due to condensation of interior moisture on the cool wall. Either of these conditions may be completely overcome by the simple process of furring the interior wall surface; this is simply placing 1x2 wood strips on the walls, 16 in. apart on which the lath is laid. When the plaster is applied there is an air space between the brick wall and the plaster. This furring provides the air space that insulates against dampness and cold.



Second Floor Plan

Of course, for interior brick walls or where there is a wall between twin houses, the furring is not needed as there is no way for moisture to get to the brick. In using brick, care must always be taken that all exterior joints of the wall, especially the head or vertical joints, are solidly filled with mortar.

There is a possibility of efflorescence which sometimes appears in the surface of the brick wall when it has been subject to excessive moisture. This can be prevented to a great extent by omitting ledges and projections in the construction that permit the soaking of water into the surface of the brick.

Face brick may be used with a hollow tile backing in place of the common brick. The advantage of this type of construction is that there will be hollow dead air spaces which act as a heat insulation in much the same way as the furring does on the solid brick wall. Both methods insure a dry, warm wall.



View of Living Room, the Sun Parlor and the Den

Building Homes That Please

Information Intending Home Owners Should Give Architects and Builders in Order to Obtain the Home They Desire

By CHARLES G. PEKER, Architect

WHEN folks decide that it is time for them to build a home of their own, they begin to think about the little features that they would like to have included in this dream house of theirs. It is a surprising fact that although people have lived for years in a house of some sort, they overlooked some of the most important parts. They were just content with having a plain, ordinary affair to live in as long as they rented it, but when it comes to owning a home they begin to think of all the desirable features possible and want them included.

Now, the architect and builder desires to please their clients and to this end no little point should be overlooked in giving the people what they want. It is rather disappointing to the builder or architect who has strived his best to please his clients to hear them say: "Oh, I didn't want this. It is not what I was after at all. I forgot to tell you about it," and other little things of a like nature.

The writer, having been through this experience quite a few times, devised a system of questions to ask a prospective client, in this way obtaining a good idea of what is wanted.

The first thing, if you cannot visit the site, is to make a rough sketch of the lot, marking the street, the size, length and width, and the points of the compass, also marking the desired location of the house. If the lot is not level, this should be noted on the sketch and arrows pointing in the direction of the slope. Of course, a photograph would help.

Your possible customer has no doubt seen in some book or magazine a design of a house that pleases him. This will be something to start with. If the plans have to be filed, this must also be noted and a proper charge made for this extra work. Ask them if they want a house one story high, one story and a half, two story, etc. Discuss the advantages, etc., with them. If they are old people there are a great many advantages to be said for the one-story house, that is, the bungalow type. Impress upon them, however, that the same amount of room can be had in a two-story house at less cost, as the foundation and roof are similar.

The Construction

We now come to the style of the house that is desired. They will probably have their minds made up whether it is to be a frame house covered with shingles, clap boards, stucco or brick veneer, brick, hollow tile, concrete, or stone.

Some, perhaps, will prefer the latter as there may be some field stone on the property. Many people get the idea that because there are a few stones laying around their property, there will be enough to build a house. Make sure that there is plenty of stone before going in too deep in this matter.

Some prefer the first story of stone or brick with the second story in shingles or stucco or some combination of two or more of these materials.

Selecting a Suitable Design

Have the house design suitable for its locality. If the site is a hillside piece of property, a very artistic result can be had by selecting a design that will "fit" into the scenery. To place an ordinary bungalow on a hilly site with one end close to the ground and the other end three stories high, would look rather ridiculous, and still, this is often done! It shows poor taste, however.

If there is to be any part of this house covered with stucco, be sure to find out what kind of finish your customer prefers. Show him samples of rough, smooth, marble chip, etc., and be sure to ask him about the color — white, cream, gray, etc.

If the house is to be of stone or brick, find out how the window openings are to be arranged, whether arched tops or flat lintels. Also find out what kind of window sills are desired, stone, brick, cement, etc. These little points are



An example of making the most of the site. The problem of the house and garage on a small lot has been carefully handled here. The roof of garage forms a terrace for the first floor rooms.

usually taken care of in the plan, but it is always best to find out what your customer wants. If the house is to be of stone find out just what kind will please him most—field, quarried, cobble stone, etc.; how the joints are to be, etc.

If the selection decided upon is a frame house find out if narrow or wide clap boarding is preferred and how the corners will be finished, whether with a corner board or have the corners mitered. Should shingles be selected for the outside covering be sure to ascertain the particular way in which they should be arranged and whether corner boards are desired or if the shingles are to be weaved at the corners.

leads to the material for the roof covering. Ask if they prefer wood shingles, composition shingles, slate, asbestos, tin, tile or one of the composition roofing materials. Be sure to ask them regarding outside chimneys, if outside chimneys are desired and if so of what material.

Porches

In regard to porches, find out where they are to be located and what size is desired, if they are to be enclosed, what kind of floor is desired, whether wood, cement, tile, etc. Should columns be used, find out the exact kind and shape. Also the porch railing, whether open rails on solid bulkhead; another little point to consider is the height of this porch

windows are to be casement and what ones are to be double hung. Find out how the sash is to be divided, one pane of glass in each or just the lower one with a single pane and the upper divided, etc. Also, inquire if any of the sash is to be of stained glass or frosted glass, etc.

In regard to the casement windows, be sure to ask if they are to swing in or out. Also if they are to be hung on the sides or top. Be sure to ask if any blinds are desired, whether inside or out, and find out about storm sashes and storm shutters.

Windows are usually to be screened but ascertain if this is to go into your contract and what kind of



Select a design for your house that will look well with its neighbors' for the benefit of all.

The Foundation

Coming to the foundation find out if the preference is for solid concrete, concrete blocks, hollow tile, stone, brick, etc. Of course, should there be stone on the property, the cheapest thing to do is to use that. Inquire what height the cellar is to be and what height of foundation wall is to be above grade.

The Roof

With regard to the roof find out what style is preferred, whether hipped roof or gable end, and whether the pitch should be high or low or perhaps just a flat roof with a parapet wall around it is desired. Another point not to be overlooked is the amount of roof projection, some prefer only a short projection and some want it quite wide.

Then take up the subject of dormers, finding out if any are desired and if so, just where. This naturally

rail; some like it low and some want it high. Also find out if a separate sun parlor besides a porch is desired, its size and location. Find out if any part of the porch or terrace is to be covered with a pergola.

Sleeping porches are in favor. Find out what size and where it is to be located. Also the floor covering, whether this is to be covered with canvas or just a plain wooden floor, etc.

Windows

In regard to the windows, take particular pains to get full details regarding the wishes of your customer on this important part of the house. Find out just what heights and widths are wanted; also if there is to be any particular space to be allowed between them; how high they are to be from the floor; how the windows are to be arranged, whether single, double, or triple, etc.; what

frames are desired. While asking the questions about screening windows, be sure to also inquire if the porch is to be screened or a portion of the pergola, etc.

Bay windows are preferred by some. Find out if they are desired, whether they are to have square or slanting sides, and if a window seat is to be used in connection with them.

Doors

In regard to doorways, be particular to ask all the details of what is desired. Find out the width, heights and style of doors they like; how the doors are to swing; whether any are to be glazed. Be sure to inquire particularly if side lights are to be used with the front door. Also if any sliding doors are to be used inside.

One very important point to inquire about is the size of the front door. Some people want a 2'6" door



Carefully state what built-in features, etc., are desired in living room, such as fireplace, bookcases, mouldings, trim, bench, doors, etc.

and some are not satisfied unless it is four feet wide. Be absolutely sure on this point. The cellar door is frequently too narrow to allow barrels, etc., to be put in easily, so it is wise to decide on the size. While on the subject of doors, inquire about the vestibule and how it is to be fitted up, either with tile or wood floor, wainscot, etc. It is a good plan to show the prospective home owners pictures of the doors to be used so that they can select exactly the ones they like the best. Very often, doors are omitted and cased openings used. Be sure to inquire if these are desired. Also inquire if any double swing door checks are to be used and whether any doors are to have transoms above. Some people dislike the use of thresholds; others want them. Find out what your customer's desires are on this point.

The Staircase

Obtain information about the stairway, that is, find out what kind of a stairway suits the house best. It would be a good plan to show different pictures of stairways, so that the intending home owners are able to pick the style they like. Often times it will be found that the stairway desired is impossible in the size of house planned. Therefore, it is the business of the designer to get it as nearly like the desired one as possible so that it will fit in the space allotted for this purpose. Take particular pains to ask about the design of newels, balusters and hand rails and whether an open or closed string is desired.

Interior Trim

The subject of trim should be carefully considered. It is rather a poor plan to finish it in birch, cypress, pine, etc., throughout. Select the wood according to the finish desired in the different rooms. If the owner intends to have the living room fitted out with mahogany furniture it is rather bad taste to have quartered oak trim in the same room, and vice versa. Find out particularly the style of trim desired—whether mitered, cabinet, etc., or whether any corner blocks are to be used. If possible, show pictures of the trim and samples of the different woods. These are little points, but they are important in pleasing your customer.

Flooring

Coming now to the flooring, find out just what is desired, keeping in mind the item of expense. If a room is to be covered with carpet it does not need hardwood floor. N. C. or yellow pine, white and red oak, and maple seem to be the favorite woods for floors. Many others, of course, are used for special cases. Parquet floors are used to quite an extent, so it is wise to ascertain just what your customer wishes. Composition or tile floors are frequently used in bathrooms and kitchens.

Built-in Furniture

Ask about built-in furniture—whether there are to be any china closets, a buffet, writing desk, kitchen cupboards, medicine cabinet, etc. Also get particular information re-



The kitchen should have the cupboards, etc., designed to embody the requirements of the housewife. The light over range is a handy innovation.

garding shelving. While on the subject of closets, find out if a rod for clothes hangers, or hooks are desired or whether the new style garment hangers are preferred. In this way, you can design the closets so that they will be sure to please your customer.

Do not forget to question the owners about linen closets, clothes chutes, dumbwaiters, etc., and if chair rails, picture moulding, etc., are to be used in any of the rooms and placed at what height.

Fireplaces

Inquire about the open fireplaces and get an idea of the size. Find out whether brick, stone, tile, cement, etc., is to be used, also what is preferred for the hearth. At the same time, ask whether the kitchen hearth is to be of tile or cement and how it is to be finished.

Walls and Ceilings

The question of the walls and ceilings is a very important one, some preferring plastered walls, either on lath or on plaster board while wall board of different makes is steadily finding favor. In some rooms sheet metal or wood is preferred. Sometimes the ceiling is of ornamental plaster. Find out if any mouldings, coves, etc., are desired, and if so, how wide and deep. Be particular to ask whether the cellar walls, ceiling and partitions, are to be plastered.



Be sure to mention that built-in buffet is desired; also the paneling, the doors, beam ceiling, etc., in the dining room

With regard to the bathroom and kitchen walls, inquire if these are to be wainscoted with wood, tile or hard plaster finish, or whether any portions are to have metal tile.

The Cellar

Regarding the cellar, ascertain whether a cement floor under the entire house is desired and how the cellar is to be partitioned off—into a laundry, coal bin, storage room, cold cellar, etc. Provision should be made for receiving coal. Therefore, ask if a coal chute or special coal window or other arrangement is to be used.



Even the bathroom may have some built-in cupboards, etc., in the home that pleases. State just what conveniences you desire.

Plumbing

Regarding plumbing, be sure to get some definite information as to whether there is a sewer in the street, and if not, whether a cesspool or septic tank is preferred. If there is a likelihood of a sewer running through the property in the near future, have the cesspool located in the front, otherwise to the rear of the lot.

Find out what is desired in the way of a water heater, that is, whether it is to be connected with a kitchen range, laundry stove, independent heater in cellar, coil in furnace, either singly or in combination, etc.

In regard to the piping, find out where outlets are desired; whether there is to be any faucet in the cellar or hose connection on the exterior, etc.

The plumbing fixtures should please your customer and the only way to do this is to have them make their own selection, either from a catalog or from actual articles. In placing the different fixtures, be sure to get them set at the proper height



Good Example of House Fitting Location

Built at Bronxville New York
Wm. A. Bates Architect

for the convenience of the people that are to use them. If the housewife is short, the sink should not be placed too high and likewise, it should not be low for taller people.

Lighting

Regarding the lighting, inquire whether gas or electricity or both is desired. If the house is to be built in a locality where these do not exist, it is wise to make provision for them, as a house is cheaper piped or wired when being built, rather than afterwards. Ask whether center chandeliers are desired, or ceiling lights, side lights, etc. Clear up the matter of floor or wall outlets for attaching different fixtures for various appliances. While on the subject of wiring do not forget the electric bells.

Range

With regard to the use of a range —coal, gas, oil, electric—this depends on the locality and the desires of your customers, so you must ask what kind is to be used in order to make proper provision for connections.

Heating

The subject of heating the house is of vast importance. You will find most people have a preference for one type of heat or the other, so you can simply ask whether stoves, furnace—steam heat or hot water is preferred and where radiators are desired or *not* desired.

Hardware

Hardware is another item on which you can please or displease a customer. You must remember that the hardware of a house is most often touched, and if a person does not like a certain thing he or she is always reminded of the fact whenever the object is handled. Although only a small point, be absolutely sure to get the design and style that your customer wants.

Gutters and Leaders

Provision should be made for removing the rain water from the roof. This, of course, is done by means of gutters and leaders. Ascertain what type the customer prefers, standing, hanging, box, etc., and what kind of material; also, if round or square rain water leaders are desired and whether they are to be of copper or galvanized iron. While on this subject, inquire if the flashings are to be of composition roofing, tin, galvanized iron, or copper.

Painting

We now come to the subject of painting. This is the finish of the house and much depends on pleasing your customer on this point. Find out what combination of colors will be desired, both on the exterior and interior. Ask particularly just how the outside trim is to be finished. If the sash is to be of one color, the frame another and the trim another, etc., all these points must be considered in advance. The same is true with the interior of the house. Go through every room with your customers, inquire just how the walls, the trim, the doors, the ceilings, the floors, etc., are to be finished.

Outside Work

Coming now to the work to be done outside of the house, inquire whether cement or other walks are to be used about the premises. If the garden is to be landscaped, consider those features which need building up. Then inquire what style fence, corner post, entrance gate, arbor, pergola, etc., is to be about the premises, and whether there are to be any out-buildings such as a garage, poultry house, barn, etc.

If this line of questioning is followed out, it will clear up the different points on which the home builder has only a hazy conception. It will enable the architect and builder to design and erect the home that the owner wants.

Cost of a House

Data Reduced to Percentages for Easy Method of Estimating the Probable Cost of a Complete Dwelling

MERELY the cost of the materials and labor that enters into the construction of a house, is not the only expense to be considered. There are other items that add materially to the cost of a house, and these should be taken into account by the home owner, as well as by the architect and contractor.

To give an idea of just what these costs are, we present some very interesting figures, which were prepared by Daniel Crawford, Jr., builder, of Philadelphia. These prices are based on 1921 operations. They give an itemized list of expenses for a house operation, totalling approximately $7,000.

The dwelling under consideration was a two-story house of six rooms and bath, built of brick. This list was based on the construction of one hundred houses from practically the one plan; therefore, it is a fair average. An owner can go over these figures carefully and put down his own values, so as to arrive at a good idea of what his new home will cost. We have carefully figured the items out in percentages so that the same proportions can be applied to buildings of more or less cost.

General Conditions

1.	Plans	$2.00	.20%
2.	Survey	5.00	.50%
3.	Building Permits and Affidavits	7.50	.75%
4	Water Permit (Brick and Stone)	1.80	.18%
5.	Electric Service	6.70	.67%
6.	Gas Service	4.00	.40%
7.	Fire Insurance on Building Material	.10	.01%
8.	Fire Insurance on Buildings	2.58	.26%
9.	Plant and Tools	12.00	1.20%
10.	Sales Expense	144.00	14.00%
11.	Advertising	72.00	7.00%
12.	Office Expense	65.50	6.00%
13.	Compensation Insurance	6.80	.68%
14.	Taxes	77.45	7.50%
15.	Interest	219.40	21.00%
16.	Title Company's Charges	123.75	12.30%
17.	Deed—Acknowledging Revenue and Recording	5.00	.50%
18.	Expense — Placing First Mortgage	108.00	10.00%
19.	Expense—Placing Second Mortgage	125.00	12.00%
20.	Supervision	36.00	3.60%
21.	Supplies	12.00	1.20%
	Total	$1,036.18	100.00%

Street Improvements

1	Sewer	$ 60.00	30%
2.	Water Pipe	30.00	15%
3.	Curb (Plain)	16.50	10%
4	Cartway Paving	90.57	45%
	Total	$197.07	100%

Construction

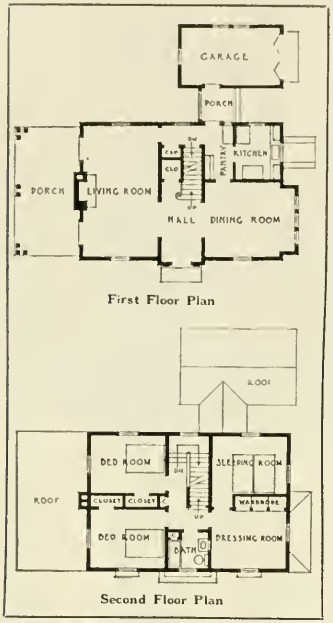
1.	Excavation	$93.60	1.97%
2.	Stone Masonry	354.42	7.18%
3.	Brick Masonry	659.71	13.30%
4.	Rough Carpentry	555.67	11.20%
5.	Finish Carpentry	610.00	12.30%
6.	Plastering	269.42	5.48%
7.	Cement Work	198.76	4.08%
8.	Cut Stone	16.00	.42%
9.	Structural Steel	33.63	.69%
10.	Roofing and Spouting	110.00	2.33%
11.	Plumbing and Gas Fitting	442.00	8.95%
12.	Heating	368.00	7.50%
13.	Electric Wiring	65.00	1.40%
14.	Stairwork	125.00	2.60%
15.	Labor—General	50.00	1.10%
16.	Tile Work	9.90	.30%
17.	Iron Fence and Clothes Poles	25.00	.60%
18.	Sheet Metal Work	85.00	1.80%
19.	Cabinet Work	40.00	.90%
20.	Hardware—Finish	32.00	.75%
21.	Hardware—Rough	24.00	.58%
22.	Painting and Glazing	215.00	4.44%
23.	Art Glass	15.00	.40%
24.	Range and Connection	65.00	1.40%
25.	Gas Water Heater and Connection	26.00	.66%
26.	Parquetry Floor	129.60	2.70%
27.	Flue Lining and Crocks	8.85	.28%
28.	Grading—General	6.30	.25%
29.	Paper Hanging and Decorating	106.88	2.25%
30.	Lighting Fixtures	85.00	1.85%
31.	Sodding and Seeding	4.05	.09%
32.	Numbering Houses	1.00	.02%
	Total	$4,842.79	100.00%

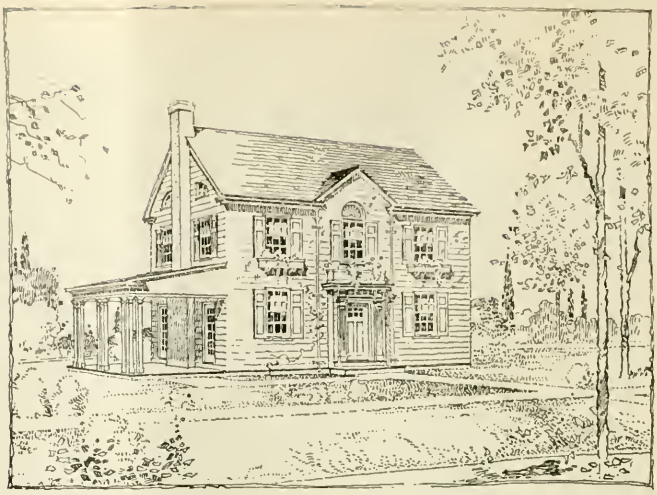
Summary

Ground (Approximate)	$600.00	9%
Street Improvements	197.07	3%
General Conditions	1,036.18	15%
Construction	4,842.79	73%
Total Cost of House & Land	$6,676.04	100%

Homes With Attached Garages

Two Colonial Designs Have This Convenient Feature





MANY people desire a garage attached to the house so that it is possible for them to enter their car in stormy weather without going outside.

The two designs shown on this page illustrate different methods of this sort of construction.

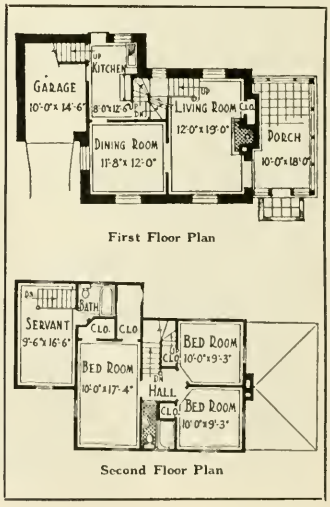
The upper picture is a sketch of a home following New England Colonial lines in its design. The garage here is at the rear and is entered from the house through a covered passage-way. It is in no sense a part of the house proper, although attached to it.

This house was designed by Watson K. Phillips, architect, of Philadelphia. The construction is frame and the outside may either be covered with wide clapboards or shingles.

The house and garage shown below were recently built at Narbeth, Pa., from plans prepared by Wallace and Warner, architects, of Philadelphia.

The house is a charming adaption of the Dutch Colonial style of architecture which, of course, found its origin in Pennsylvania.





How Own Your Home Expositions Help the Building Industry

By CARL B. EIMER, A. B.

Member National Association of Real Estate Boards

VISITORS attending the "Own Your Home" Expositions, held in Chicago, Cleveland, Detroit, San Francisco, Trenton, Boston, New York, etc., should be impressed through the usual publicity channels that these Expositions are no place for the curious or those who wish to be entertained. Those who are closely connected with the Expositions realize more each year how necessary it is to limit the attendance to people really anxious to learn the elements of home building and benefit by the authoritative information available on each and every phase of construction and equipping.

To those who are not informed as to the origin of the "Own Your Home" Movement it is interesting to know that it was fostered by the U. S. Department of Labor and first called the "Own Your Home" Department of the Labor Department.

The program contemplated was most elaborate but the founders of the movement were without sufficient funds to carry on the necessary educational campaign which must be concurrent with such a new undertaking.

During the war the program was practically abandoned though the construction of small homes was decreasing in an appalling way. The tendency of the American people to become rent payers has increased as the population has increased for the past five years. The war, limiting construction, and the attendant high cost of materials and labor, was no stimulant to the weak urge of the new "Own Your Home" Movement to the nation to build.

It was then about five years ago that Robert H. Sexton, who was probably the best informed man in the country on the housing problem, succeeded in organizing a little group of men who came to believe that the only way to bring relief to the congested centers where new housing was so badly needed was in bringing together all the interests dependent upon housing construction in a concerted appeal to the public.

Alfred Wagg was then regional director for the government in New York City, of the "Own Your Home" Movement and was with the writer connected with the Amsterdam Development and Sales Company. Mr. Wagg and myself were fortunate to be among this first group interested with Mr. Sexton in visualizing the movement as first planned by the government.

WE were determined to bring together the architects, the landscape gardeners, the banks and building and loan associations, the contractors, the manufacturers of building materials, plumbing installations, ventilating systems, heating apparatus, gas and electrical appliances, paint and varnishes, wall papers and furnishings and a hundred other industries that would benefit by the resumption of the building of homes.

We knew that if these interests could get right at the general public, show them how attractive each part of the home could be made and submit the lowest possible figures to them, that we could immediately explode the theory that paying rent was a cheaper way to live.

Labor and materials and many other necessary products were extremely high at that time but so were rents way out of proportion. Statistics of banks, Government bureaus and other authorities show that up to 1913 the average man paid 20 per cent. of his income for rent, but now in 1921 and up to the present time, the same figures show that he pays 40 per cent of his income for rent—and it is paid at the expense of almost every other trade, business or profession—diverted to the pockets of the landlords. Not only have business men suffered generally, but the halt in building which has enabled landlords to maintain the high rents has deprived families depend ent upon the building industry for their incomes of a means of living Eleven million people are dependent either directly or indirectly upon the building industry.

Now when the average man is paying the 40 per cent. figure for rent, and materials and labor are much lower than even at this time last year, every indication points to a most successful Exposition in New York, which will be held in the 69th Regiment Armory, April 22nd to 30th, 1922.

Manufacturers and dealers are realizing more and more that placing their wares on a counter or table in a row will not stimulate a visiting public to rush out and purchase a lot and evolve the dream house they have always wanted.

Different committees pass on all concerns accepted in each division, disseminate all publicity on the work of special divisions, and insist that exhibits are of educational character.

THE dream house must be achieved at the Exposition before them; therefore, the exhibits will be in the form of side walls of lumber, brick and stucco; bathrooms entirely fitted; kitchens equipped with the latest and most approved appliances and labor saving devices; music rooms that will appeal to everyone of good taste and a love of beauty; all making a strong selling appeal for building materials, bathroom fixtures, kitchen floor covering, ranges, pianos, draperies, rugs, wall papers and every other item that will be shown in the applied form.

Let everyone get behind this movement and watch the sales reports after the Exposition. Of more importance, however, than the commercial value of such a medium as the Exposition is the fact that a thousand more home owners are a thousand more stabilizers of our local and national government, heralds of prosperity, whose buying power is unlimited

A New Servant in the Home

By LILLIAN CASSELS

Of the Society for Electrical Development

IT IS well to remind those who build our homes that the word "economy" must not be understood as a mere pinching of the dollar. It has been dignified, in circles where thought is given to the relation of the home to the great structures of society and government, into the term Home Economics. And this is being worked as rapidly as is possible into a system of labor-saving which must very soon replace that labor-wasting which has surrounded housework in the past.

It has been demonstrated in numberless ways that woman is destined to play a definite part in the scheme of progress. For long the servant as well as the mother of the race, she has been in nearly every home a drudge, a wrestler of pots and pans, a servant without recompense, with never an afternoon off or a moment for leisure. And in all but a small proportion of those homes, this condition still prevails.

And still, as shown in a recent bulletin issued by the Smithsonian Institute, modern use of electricity, steam, and machinery has so simplified labor in general that this power, if divided per capita, would give to every man, woman and child in the United States labor that would require thirty individuals to perform by hand.

"This," says the amazing Smithsonian statistician, "gives every person in the nation the equivalent of thirty slaves!"

Women are beginning to claim an equitable division of this stock of slaves. In many homes, devices which perform the hard labor of housework by electric power instead of by personal power are being installed as fast as the women in those homes learn of the real value of machinery in housekeeping. In the home whose plans and electric itinerary is pictured here, there has been ample provision made for the most important electrical servants; for if electrical devices are to be used by women to the best advantage it is essential that the electric circuit, which is coming to be recognized as woman's "Circuit of Service," shall contain plenteous outlets so that her flock of servants can get out. Locked up within the wires they are but potential slaves; given abundant convenience outlets they will stand ready, willing, ever alert, ever powerful, to perform all the hard labor of housekeeping, making women truly the mistresses of goodly retinues.



Electricity in the Bedroom Finds Many Uses. View in Electric Apartment of Queensboro Corporation, Jackson Heights, New York.

In every room, it will be noted that the electrical plans have included one or more convenience outlets that may be used for attaching the electric cleaner. This powerful little engine of sanitation is so well known in its functions that it needs no introduction; yet there are many homes where if it is used at all the housekeeper must climb on a chair, detach a lamp, and hang her cord to a chandelier or bracket. This robs the sweeper of much of its efficiency.

In the kitchen there is provision for a dishwasher, which has in homes where it is known transfigured that task which is perhaps the most sodden and drab of all the assortment of disagreeable jobs; which has taken out of dishwater forever the hands which need now but to clear dishes and put them away, thus freeing those hands for more pleasing and more womanly tasks. There may also be attached a kitchen motor, which in many forms is being offered to do all the beating, whipping, kneading, mixing and grinding jobs that help to make cooking tedious when done by hand.

As the housekeeper becomes familiar with electricity, she will find every year some new servant which she will soon learn is essential in her newly formulated plan of home economics, and, as in every instance electric servants prove to be of real economic value in the long run, it is well to install during the home-building, provisions for the future development of this inevitable force which is moving toward the establishment of real home economy; a home economy which proposes to surround the intimate phases of life with administrative efficiency, while freeing the spirit that animates those homes for more joyous occupations than that of household drudge.



Attractive Brick Bungalow

Unique Design Containing Five Conveniently Arranged Rooms

HERE is quite an attractive design of a bungalow home built of brick. Its outstanding feature is the terrace on the right hand side, reached through an archway of wood. This terrace serves the purpose of a porch and, of course, must be built on the shady side of the house. From this terrace one can reach both dining room and living room through French doors.

There are two large bedrooms in this bungalow, between which is the bathroom. The adjoining hall in a T shape connects with every room in the house. Note the many convenient closets; coat and linen closet in the hall, large bedroom closets, built-in dressers in bathroom.

From the entry porch one enters the living room, which is of ample size and which contains a large open fireplace with a bookcase four feet high at one end.



"This is the true nature of home: It is the place of peace, the shelter not only from all injuries, but from all terror, doubt, and division In so far as it is not, thus is not home."

—John Ruskin.

Over this is a double casement window which, with the mullioned window and the glass door in this foremost part of the house, gives sufficient light to the front part of the living room, and the French doors leading out on the terrace light up the rear part of this room.

The dining room has a built-in buffet and is exceptionally light, since the French doors open on to the terrace with a window at the rear and one at the side.

The kitchen is rather an odd shape, but it is very convenient. There is no cellar under this house, as it was intended to be built in the South. Since the arrangement does not include a cellar, plenty of closet room has been provided for storage purposes. Where necessary, this bungalow can be conveniently heated by means of a small hot water system, such as is now on the market at small cost.

FOUR FAMILY BRICK HOUSE



HERE is an attractive design for a convenient four-family house. The plan has been so arranged that each family has the advantage of having a separate entrance, all are entered from a common vestibule.

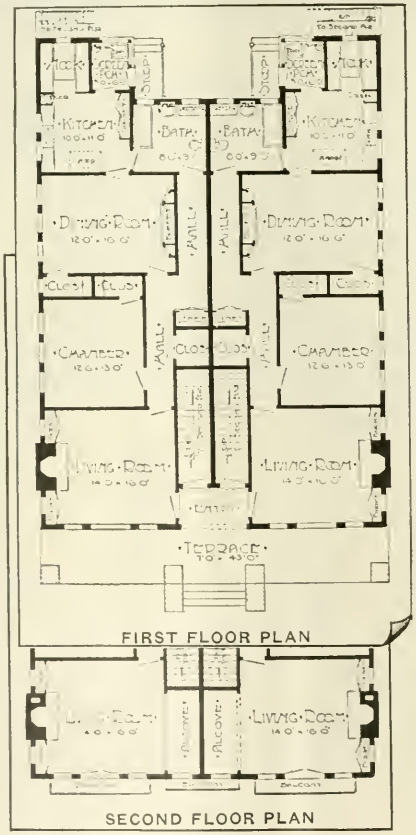
As the plan shows, the rooms are exceptionally large in size and are comfortably arranged. A feature of the living rooms is a large open fireplace with bookcases on each side. The dining room has a large, built-in buffet on one side.

Each kitchen has an attractive breakfast nook. The sink is placed directly underneath the window with a drainboard on each side. A screened porch in the rear serves as a service entry.

On the second floor, the space above the entry was utilized as an alcove to the living room. This has been arched over and made a pretty feature of the room.

The cellar contains the heating plant, as well as the hot water heating system which supplies all apartments with the needed hot water.

As shown, this apartment house is built of brick, but a similar house can be built of hollow tile, stucco, solid concrete or concrete blocks, stone or even frame.



The arrangement of the French windows on the front is a distinctive feature of the design. All rooms are supplied with closets.

This apartment house was recently built by the De Luxe Building Co. of Los Angeles, Cal.

An apartment house such as this forms a very desirable investment. The rental from three apartments would be sufficient to pay the upkeep of the house and the owner can reside in one apartment practically rent free.

This house can be successfully built on a 50-foot lot, but of course, if more space is available, so much the better. Plenty of air space would add to the desirability of the apartments.

A good deal of the appearance of a house of this sort depends on its setting. If it is too close to the street, it loses its beauty. As shown above, it is set back about 25 feet from the street line, allowing a rather dignified approach to be used. With planting as shown, the house is set off in proper shape.

Cost of Industrial Buildings

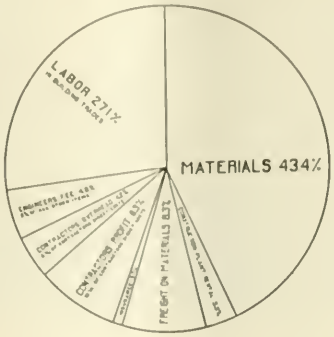
Interesting Chart Showing Distribution of Owner's Direct Building Costs

By MONKS & JOHNSON, Engineers, New York

THE chart presented opposite shows the proportion of the cost of a typical industrial building which is attributed to each item of an interesting classification.

Five of these items—namely: Engineer's fee, Contractor's overhead, Contractor's profit, Insurance and Plant rental—fluctuate but slowly, and that only as the cost of commodities in general rises or falls, or as they are directly affected by the remaining three items of the chart.

Labor. Wages of artisans employed in the building trades gradually rose from December, 1913, to a peak in May, 1920, and from that peak they have descended not more than fifteen per cent. But the efficiency of labor, which had fallen as wages rose, has returned to that which obtained in 1914. This is due primarily to the scarcity of work. As a result of this increased efficiency the cost of labor on buildings has probably fallen fifty per cent. from the peak of the war period.



Material. The price of materials depends upon the cost of production and demand. The demand for building materials has been so small during the last twelve months that it is probably true that in order to stimulate the market, materials have sold at a price leaving the manufacturer and dealer no profit, and in some instances have probably been sold below what it cost to produce them. The price quoted in the open market for building materials would not indicate that these sacrifices had been made, but contractors have recently been able to buy at prices far below market quotations. The cost of production is therefore not an important factor at the moment and in any event is likely to change but slowly. From this analysis of the market it would seem that no substantial drop in prices will occur within the next year, but that the seasonal demand likely to occur in the Spring will undoubtedly cause a stiffening of prices.

Freight. There is some talk of a reduction in freight rates, but a cut of twenty per cent. in this item would result in a decrease of less than two per cent. in the cost of building.

Conclusion. From the foregoing short discussion it would appear that the cost of building now is as low or lower than it will be at any time in the next year.



Factory Buildings Can Be of Attractive Design as the Above Picture Shows—This Is the New Building of Browstein Company, Clothing Manufacturers, of Los Angeles, California

Setting Out Grade Stakes on the Building Site

A Simple Method That Can Be Followed by the Contractor

By JOHN P. COYLE

HAVING often met, during the course of my work, many builders and superintendents who were keen to have explained and shown to them how the transit and level was used and the method followed in giving the various elevations required on a building job and reading in the July issue of BUILDING AGE the interesting article by Mr. R. P. Smith on simple surveying has prompted me to write this article in the belief that it will also prove interesting and useful to the many readers of BUILDING AGE.

The setting out of a few grade stakes or giving the elevations required during construction is not, as a rule, a difficult operation, and should be understood by every builder and superintendent. It is hoped this article will make clear the simple procedure followed. Either the transit or level may be used, generally the transit on building jobs, as with it lines may also be run and angles laid off.

The rod used should be preferably one of the target type used in leveling, but a piece of stick may be taken and marked off, or at a pinch a six foot rule or a tape may be used.

The elevations are always found referred to some point, whose elevation, either actual or assumed, is known. This may be a city bench mark (B. M.), a point on an adjoining building, or a point on the curb near the proposed building.

To illustrate how a line of levels is carried along, let us assume that a B. M. some distance away from job is used, and that its elevation is given as 110.50. Let the rod be held on this point, then with instrument set up a convenient distance away, take reading on rod where it is intercepted by horizontal cross hair in telescope. Say this reading is 4.50. This is known as a + or a foresight and is recorded as shown in column 2 (Fig. 1), and this reading added to elevation of B. M. gives the height of the instrument or H. I., shown in column 3. The rod is now moved forward ahead of instrument and another reading taken, say 3.10. This is called a — or backsight and is put down as shown in column 4. The reduced elevation in column 5 is obtained by subtracting the backsight from the height of the instrument and is the elevation of the point where rod is held.

Elevation Bench mark	Foresight +	Height of Instrument H I	Backsight —	Reduced Elevation
110 50	4 50	115·00	3 10	111·90

Showing how field notes are recorded

Still holding the rod in same position, the instrument is now moved ahead, set up and the rod read again, and this new reading added to the last reduced elevation, gives the new height of the instrument. This process is repeated until site is reached, when last reading can be taken on some convenient and permanent point and its elevation established for future use during construction. It will be seen that with the instrument height known, any number of — sights or "shots" can be taken, and any given elevation set out. For example, suppose that a cellar excavation is in progress and that it is down to somewhere near subgrade. The H. I. is, say 102.60, and subgrade elevation is given as 94.20. Let rod be held on any desired point in the excavation and a reading taken which is, say 7.40, and subtracting this from H. I. gives a reduced elevation of 95.20, showing that the excavation at that particular point is still 1'-0" above subgrade.

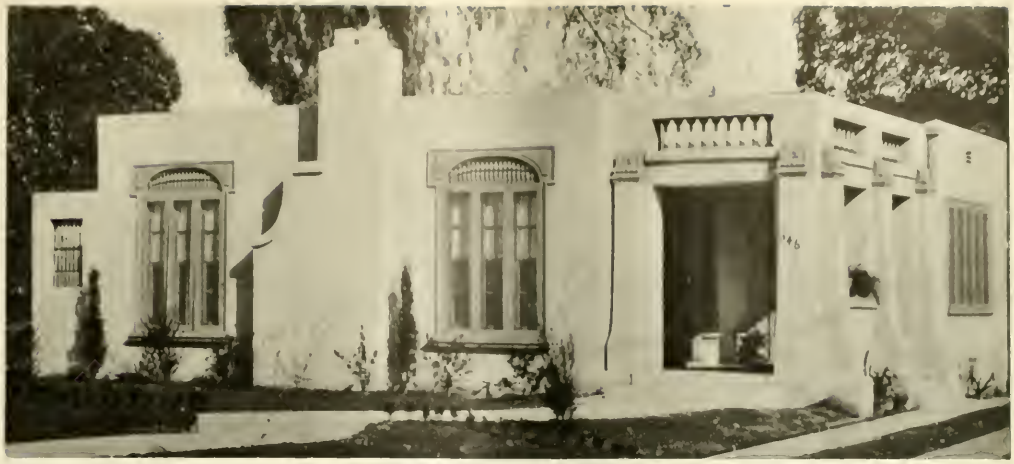
As another example showing how the rod may be used inverted. Let it be required to set out an elevation of 106.40, and that the H. I. is the same as before, viz., 102.60.

Now 106.40 — 102.60 = 3.80, or the required elevation is 3.80 higher than H. I. Invert the rod and raise it up until 3.80 is read on it, then upper end of rod will be at elevation 106.40. See that the rod is always held plumb. It is a good idea also to check back to the B. M. or starting point, particularly when a line of levels have been run, as an error can then be detected, either in the notes or as sometimes happens, in a reading, in which case it may be necessary to run the levels over again.

Advertising the Building Contractor



THE progressive builder will advertise his business in different ways and having a sign on every building that he is erecting is one of the best and most effective ways to bring his name before intending home builders—they are the ones that will look over each job to see how it is being put together. One enterprising Pennsylvania builder has a novel sign board that talks building and we are glad to publish a picture of this for the benefit of our readers. Here is a good suggestion that is worthy of imitation. Mr. Worrall is not only a good builder, but a clever advertiser—he even makes the name of his town, "Kennet Square, Pa.," stand out differently, folks will remember him. The construction of the sign board is simple and the effect is unique. Any builder can make his own sign board at small cost.



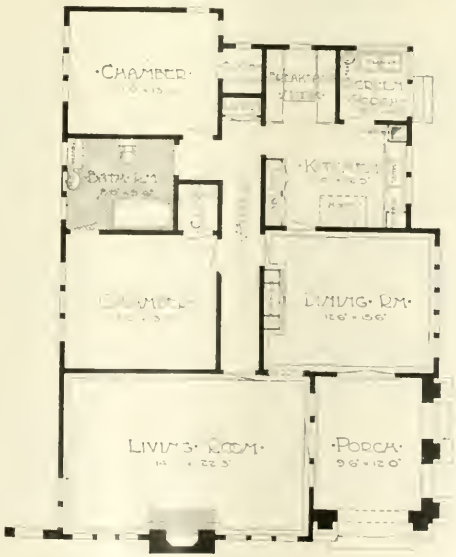
Bungalow *of* Spanish Design

By CHARLES ALMA BYERS

HEREWITH is illustrated an exceptionally artistically handled interpretation of the Spanish-style little house now so popular in southern California. It is distinctive mainly in that its exterior shows considerable ornamentation. This ornamentation is found introduced principally about the small corner porch on the front—in the capital treatment of the pilaster effects and in the railing inserts of the roof walls—but also to some extent in the decoratively-finished tops of the front window groups, as well as in the grilled window of the wall extension from the left front corner.

The outside walls of the house are of tan-colored cement-stucco over frame construction, and the trimming about the windows, as well as the pilaster capitals, is done in greenish-brown. The roof, like that of the Indian pueblo, is concealed, being flat and of composition. A massive stucco-surfaced chimney gives relief to the main front wall, and the windows on the front, as well as the group on the right side, are of the casement type. The corner porch is floored with cement, and from it there is a main doorway leading directly into the living room, and also a pair of French doors giving immediate access to the dining room.

The house contains, as reference to the accompanying floor plan reveals, living room, dining room, two bed rooms, bath room and kitchen, besides the customary rear entry porch and a most charming breakfast nook off the kitchen. A center hall provides convenient connections, and, suggesting the bungalow in this respect, there are many delightful built-in features and large closets. The dining room, for instance, contains an excellent cupboard and sideboard combination, the bath room has a medicine case and a cabinet of dresser drawers and shelves, the hall possesses a linen cabinet, the kitchen is equipped with the usual cupboards and sink and a draught cooler-closet, and the breakfast alcove is provided with the usual stationary seats and table, while a pair of laundry trays is a screened porch feature.



The interior finish consists of old ivory with mahogany trim in the living room and dining room, old ivory alone in the bed rooms and hall, and white enamel in the bath room and kitchen. Hardwood flooring is used throughout except in the bath room and kitchen, which have tile floors.

This little house is located in Los Angeles, California, and the plans are by the De Luxe Building Company, of that city. It possesses neither basement nor cellar, but is equipped with built-in gas radiators for heating and all modern conveniences.

Heating the Low-Cost House

Describing the Layout and Cost of the Hot Water System of Heating

By CHARLES L. HUBBARD

A SYSTEM of hot-water heating is similar in construction and operation to one designed by steam, except hot water is the medium of heat transmission from the boiler to the rooms. The circulation through the system is due to the difference in weight of the water in the supply and return risers leading from the boiler to the radiators above, which in turn varies with the difference in temperature and the height or elevation of the radiator above the boiler. This motive power is very small, which makes it necessary to exercise considerable care in laying out the supply and return piping in order to give an even distribution of heat to the different radiators. For example, with an elevation of 30 ft. above the boiler, and a difference of 10 deg. in temperature between the supply and return, the force available for overcoming the friction in the pipes and producing a circulation through the radiator is equivalent to that produced by a difference in height of about 1¼ inches in the two columns of water.

CHANGES IN BUILDING CONSTRUCTION.—The conditions in this respect for direct hot-water heating are practically the same as for steam, and need not be especially considered in laying out the building plans. If indirect stacks are to be employed, the framing for the registers and any cold-air supply inlets should be taken into account.

BOILERS.—Boilers for hot-water heating are similar to those for steam, the round cast-iron type being commonly used for the smaller sizes, and the sectional (see Fig. 1) for the larger ones. There is no dividing line between the two, as to size, and they overlap more or less in their practical application.

RADIATION.—The efficiency of a direct hot-water radiator depends principally upon the temperature at which the water is circulated. The best practical results in gravity heating are obtained with the water leaving the boiler at a maximum temperature of about 180 deg. in zero weather and returning at about 160 deg., which gives an average temperature of 170 deg. in the radiators.

Under these conditions, with a room temperature of 70 deg., we will obtain about 170 thermal units per sq. ft. of radiating surface per hr. as against 250 for low-pressure steam. In other words, a hot-water radiator

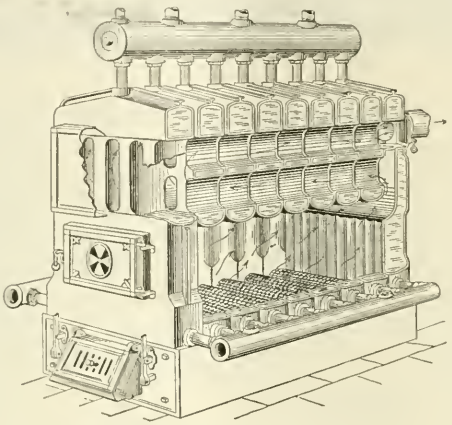


Fig. 1—Sectional Hot Water Boiler

to warm a given room must have $\frac{250}{170} = 1.5$ as much surface as a steam radiator supplied with steam at 1 lb. pressure. Of course, if the temperature of the water is increased, the efficiency of the radiator is also increased and the surface can be reduced in like proportion, but as stated above, the temperatures given have been found to be about the most satisfactory, everything considered, and this ratio between water and steam surface is generally accepted in practice for this class of work.

The method of computing radiating surface for hot-water heating is to divide the total heat loss from the room, in thermal units per hr. by 170, the result being the square feet required.

Computing the radiation for the different rooms, by the same method as for steam, but using an efficiency of 170, we have the following amounts required for the different rooms.

(Hot-water radiation required for the different rooms.)

Room.	Square feet of direct hot-water radiation.
Living room	102
Hall	17
Dining room	52
Kitchen	42
Second Floor—	
East bedroom	80
Southwest bedroom	42
Northwest bedroom	44
Bath	16
Hall	21

In this case we will use 3-column radiators, except in the front hall, 32 in. high, the number of sections being marked on the plans. In most cases this gives slightly more surface than called for in the above table, as an integral number of sections will not correspond exactly with the computed surfaces.

A slight increase is purposely made in the bathroom radiator, and about 80 per cent. in the entrance hall to offset excessive leakage at times of opening the outside door.

Radiation for the upper hall has been placed on the first floor beside the stairway the same as in the other systems of heating previously shown.

Direct radiation has been kept from the main entrance vestibule and also from the living room by the use of "rotation" heater.

These are indirect stacks made up of pin radiator sections and hung beneath the floor. They are encased in galvanized iron and the path of the air through them is similar to a hot air system.

In computing the size of a regular "indirect" radiator, taking its entire air supply from out of doors, it is customary to compute the surface for direct radiation and multiply this by 1.5 for "pin" radiators of good depth.

PIPING.—A common method of making the pipe connections for a

system of hot water heating is shown to have direct mains and returns for each individual radiator. In this case an air valve must be placed in the top of each radiator near the return end. It is advisable to use pet cocks operated by hand in this case instead of automatic valves, because if anything happens to clog it, when in an open position and prevent it closing promptly, much damage may be done to floors and ceilings by the rapid leakage of water under these conditions. Another important matter in connection with hot water heating not called for with steam, is provision for expansion.

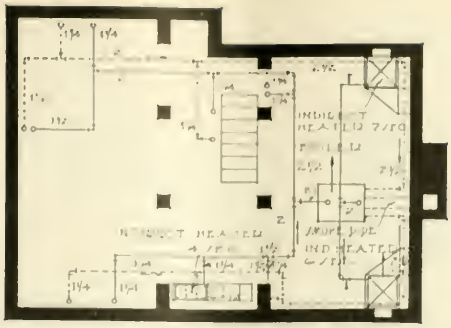


Fig. 2—Basement Plan

When water is heated it expands, and a vented tank must be placed well above the highest radiator and connected with the system of an "expansion pipe" to catch the overflow and to deliver it back to the system when the water cools and contracts.

The expansion pipe may make connection directly with the boiler, or if desired, it may be taken from the top of one of the risers to the upper floor. In any case it must be on a line which can never be shut off from the boiler. If by any chance it were shut off and forgotten, a dangerous explosion might occur when the temperature of the water was next raised. Another piping arrangement, which is self-venting, is sometimes used. In this case there are no pockets and the air can flow from all high points directly to the expansion tank, which is vented to the atmosphere. A single-pipe arrangement is shown at the left which reduces the number of drops or risers passing through the lower rooms. This is often a matter of some importance if they are not concealed. In this case both supply and return connections are made with the same end of the radiator, as indicated in the drawing. Under these conditions the water supply to the lower radiator is cooled somewhat by the return from the upper one, but with properly proportioned pipes this is so slight a matter that it may be neglected in buildings now over two stories in height. A two-pipe connection is shown at the right with the supply inlet at the top of the radiator. No air valves are required with this system of piping which is a strong point in its favor. Care should always be taken to locate the expansion tank where there can be no possible danger of freezing or of the pipes connecting with it.

The upper part of a closet, opening from a warm room or a bathroom, are usual locations for the expansion tank. If it must be placed in the attic it should be located close beside the boiler chimney flue and closed in with a wooden boxing lined with hair felt. This should enclose it on all sides except that against the chimney which should of course be left open to admit the heat.

SIZES OF DIRECT HOT-WATER HEATING MAINS AND BRANCHES.

Diameter of pipe, Ins.	Sq. ft of radiation.	Diameter of pipe, Ins.	Sq. ft. of radiation.
1	30	2½	350
1¼	60	3	550
1½	100	3½	850
2	200	4	1,200

SIZES OF RISERS TO UPPER FLOORS, DIRECT HOT-WATER HEATING.

Diameter of riser, Ins.	Sq. ft. of radiation—1st floor.	2nd floor.	3rd floor
1	30	55	65
1¼	60	90	110
1½	100	140	165
2	200	275	375
2½	350	475	

SIZES OF MAINS AND BRANCHES FOR INDIRECT HOT-WATER HEATING.

Diameter of pipe, Ins.	Sq. ft. of radiation—Air rotated from inside building.	Air taken from outside of building
1	20	15
1¼	45	30
1½	75	50
2	150	100
2½	260	175
3	400	275
3½	600	425
4	900	600

Comparison of Costs.—The approximate cost of installing the system, as shown in Figs. 2, 3 and 4 is $1,155. Thus we have $475 for furnace heating with a return-air arrangement; $800 for a plain system of low-pressure steam, and an approximate increase of 25 per cent. or $1,000 for an average system of vapor heating; and $1,155 for hot water, with indirect stacks for the living room and entrance vestibule.

Where indirect stacks are used, as in the living room; their elevation above the boiler is apt to be slight and in consequence the circulation is likely to be sluggish if they are placed on a supply pipe leading to the upper floor radiators. To avoid this trouble, have a separate supply line properly vented by pet cock or a small vent pipe direct to expansion tank.

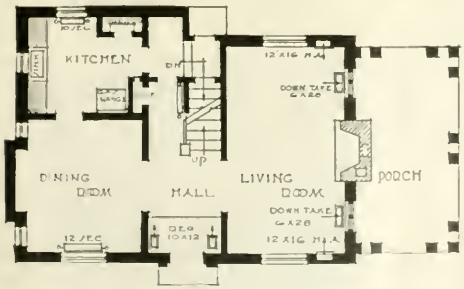


Fig. 3—First Floor Plan

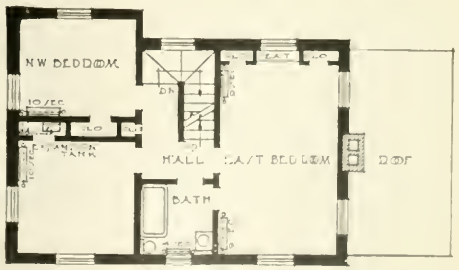
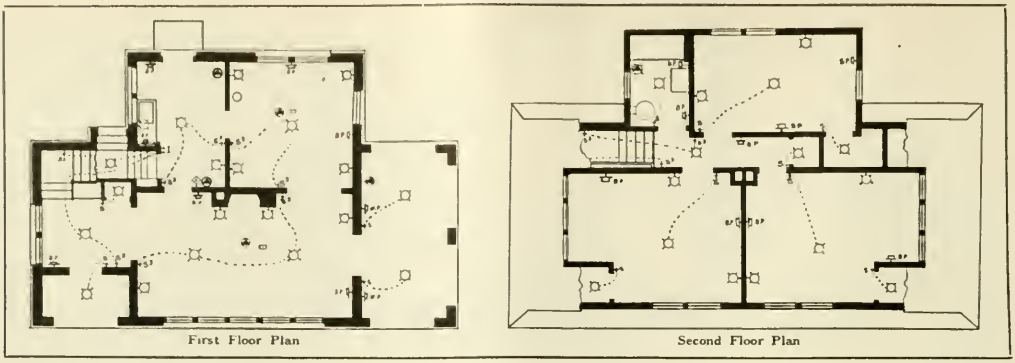


Fig. 4—Second Floor Plan



Electrical Equipment of the Modern Cottage

Suggested by REGINALD TRAUTSCHOLD, Electrical Engineer
of the Society for Electrical Development

PROPER location of the various electrical outlets is deserving of considerable study and the layout given here will give valuable suggestions along this line. The list of appliances will give an idea of the devices which would be desirable in a house like the Modern Cottage shown on another page. It is not intended to recommend all the appliances, nor is it expected all would be used in one house, but the list does indicate what might be used.

LOCATION OF OUTLETS, ETC.

Cellar

Ceiling light outlet at foot of cellar stairs controlled by switch at head of stairs.
Ceiling light outlet near heater.
Wall light outlet at service panel.
Ceiling light outlet near coal bin.
Special service outlet for cellar work shop tools.
Ceiling light outlet in cellar work shop.
Bell transformers or batteries for bell circuits.

Porch

Ceiling light outlet for entrance porch controlled by switch in hall.

Hall

Central ceiling light outlet controlled by 3-way switches in hall and at head of stairs on second floor.
Ceiling light outlet in closet controlled by wall switch in door frame.
Outlet for light on newel post.
Convenience wall outlet for vacuum cleaner and floor lamp.

Living Room

2 ceiling light outlets controlled by 3-way switches at hall and dining room entrances.
Wall light outlets on either side of fireplace.
2 wall light outlets.
2 convenience wall outlets.
1 special service floor outlet.
Floor bell connection to kitchen annunciator.

Dining Room

Central ceiling light outlet controlled by 3-way switches at kitchen and living room entrances.
4 wall light outlets.
Special service floor outlet for table appliances.
Special service wall outlet for serving table.
Floor bell connection to kitchen annunciator.
2 convenience wall outlets.

Kitchen

Central ceiling light outlet controlled by 3 way switches at living and dining room entrances.
Wall light outlet over sink.
Wall light outlet over range.
Special service outlets for irons and for electric range and water heater if cooking rate pertains.
2 Convenience wall outlets.
4 Call annunciators.

Living Porch

2 Ceiling light outlets controlled by wall switches.
2 Convenience outlets for service or lights.
1 Special service outlet for tea table appliances.

Second Floor Hall

Ceiling light outlet controlled by 3-way switches at stair landing and near bathroom door.
Ceiling light outlet for linen chest controlled by wall switch in door frame.
Convenience outlet.

Bed Rooms

Central ceiling outlet controlled by switch at door.
2 wall light outlets.
2 convenience wall outlets.
Bell connection to kitchen annunciator.

Bath Room

Ceiling light outlet controlled by switch.
Convenience outlet.
Bell connection to kitchen annunciator.

SOME SUITABLE APPLIANCES

General House Use

Lighting — Vacuum Cleaner
Fan Motors (0.2 to 1 ampere)
Bell-ringing Transformer

Kitchen

Range (requires special circuit)
Tea Kettle (4 to 5 amperes)
Disc Stove (2 to 6 amperes)
Frying Pan (5 to 6 amperes)
Radiant Grill (5 to 6 amperes)
Toaster (4 to 6 amperes)
Meat Chopper — Coffee Grinder
Egg Beater — Bread Mixer
Knife Grinder — Silver Polisher

Cellar Work Shop

Grinder
Glue Pot (2 to 5 amperes)
Soldering Iron (1 to 2 amperes)
Bench Drill

Laundry

Washing Machine (2 to 3 amperes)
Irons (4 to 6 amperes)
Laundry Machine — Wringer

Garage

Fire Pumps — Portable Drill
Grinding Machine — Buffing Machine
Charging Batteries

Dining Room

Chafing Dish (4 to 6 amperes)
Percolator (3 to 5 amperes)
Cigar Lighter (0.25 ampere)
Water Heater (1.5 to 10 amperes)
Radiator (2.5 to 5 amperes)
Samovar (4 to 5 ampeers)

Bedroom or Boudoir

Curling Iron — Massage Vibrator
Bed Pad (0.5 to 1 ampere)
Reading Lamp
Hair Dryer (0.5 to 0.75 amperes)

Miscellaneous

Sewing Machine
Milk Warmer (3 to 5 amperes)
Shaving Mug (1.5 to 5 amperes)

Note: — Ampere capacities within brackets are guides for special service outlets. If more than 2 or 3 amperes are required, special circuits should be employed.

Plumbing Equipment for the Modern Cottage

Shown on Page 24

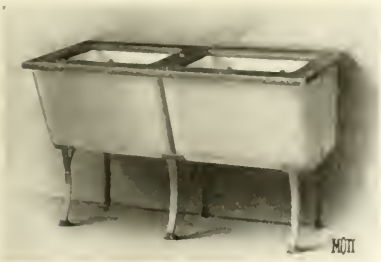


SELECTING the proper fixtures for the plumbing equipment of the home is an important point. A good deal of one's comfort depends on having reliable plumbing fixtures. They should be as good as one can afford to have.

For the kitchen we would advise a sanitary sink of enamelled iron with drain board and back all in one piece. For a good-looking finish it is also advisable to have this with an apron as shown in our illustration. The sink pictured here has a combination swing nozzle faucet which enables one to have the water at the desired temperature.

In placing the kitchen sink, particular care should be taken to have it at the proper height so that it will be comfortable for the lady of the house. The sink shown here has no legs, but is supported by concealed hangers placed behind the high back of the sink. It will be noticed that the drain board is on the left side. This is the most convenient for dish washing as it saves one motion.

The laundry tubs are located in the cellar. These can now be had in white porcelain at a moderate price. They are set upon legs to the desired height and are easily kept clean.



They are certainly a far advance over the old wooden stationary tubs that were first used or the more recent cement composition ones.

It is in the bathroom that fixtures and fittings, of course, show to the best advantage. In the center illustration, we show a very desirable outfit for the bathroom suitable for the Modern Cottage. There is an enameled iron bathtub, five feet long with a shower attachment. A pedestal lavatory is shown and above this a glass shelf and mirror with electric lights on both sides. The water closet is of porcelain with a low down porcelain tank. The seat of the water closet can be obtained in either oak, mahogany or white enamel finishes, as may be desired. As shown in the illustration, this bathroom has a tile floor and wainscoting.



These illustrations are shown here through the courtesy of the J. L. Mott Iron Works.

Of course, if one prefers, other designs of fixtures may be substituted, but those shown will prove satisfactory.

Do not try to save money on the piping. Cast iron pipe is usually employed for the drain pipes and these are generally concealed in the walls. The joints should be carefully packed with oakum, then filled with molten lead and caulked so as to make an absolutely tight joint to prevent sewer gas escaping.

For water service, galvanized iron pipe is now almost universally used; for ordinary purposes ½- pipe is sufficient.

It is very desirable to have separate cut-offs for each line of water piping, so that any one fixture can be cut off on either the hot or cold water supply, whenever it may be necessary. All faucets will require renewing of the washers and if separate cut-offs are used, one fixture can be closed off instead of shutting down the entire house. Gate valves, though they cost a little more, are to be preferred as they are easily operated.

Leaks sometimes occur and then it will be found very desirable to be able to shut off the damaged section without closing off the entire water supply. This is a feature that will be found very convenient by the lady of the house, because, the fates have it, that this sort of an accident usually occurs when she is alone. There should be a shut-off valve in the cellar where the water supply enters, as well as an outside cut-off at the lot line.

Exterior hose connections should have a shut off valve inside cellar so that exposed portions can be drained

Decorating the Modern Cottage

Suggestions for Simple Artistic Effects that May be Carried Out at Small Cost

By MISS C. W. WILSON

THE color combination for exterior of the Modern Cottage shown elsewhere in this issue may be varied to suit taste. As a suggestion as to what can be done to secure an artistic looking home the stucco may be of light cream color, the trim such as sash, doors, seat and entry, flower box, etc., in white; the shutters, leaders and gutters in a tapestry green; the chimney of course in stucco with the top of red brick. The color of the roof can be either green or red as preferred; either would look well for this design of house.

The Hall

On entering this house one would come into the hall and see a neat stairway in mahogany and white with the trim finished in white enamel. The walls may either be tinted or papered, as desired, we would suggest that this be carried out in Colonial gray. The same painting or paper should be used for the hallway on the second floor.

A green tapestry cushion furnished for the seat gives a touch of color. At the window the curtains may be of iridescent Sundour silk, which shades from a soft green to a pale dove gray. One or two small Oriental rugs in the hall and a plain gray carpet with small black figures on the stairs make a good combination.

The Living Room

The walls in the living room should be gray, a little darker than that used for the hall. The woodwork in this room may be finished in mahogany, and the ceiling tinted white. The fireplace is of red brick; select a design that is Colonial in appearance. The rug for this room should be two toned gray and the hangings in a soft mulberry tone.

In furnishing this living room, we would suggest that a large six foot davenport, upholstered in striped mulberry mohair, be placed before the fireplace and backed by a six foot mahogany table. On either side of the fireplace, we would suggest placing a fireside wing chair, upholstered in the same material as the davenport and another chair in a soft-toned tapestry. Then one may use one or two small floor lamps with silk or parchment shades, one or two end tables and a few other individual pieces of mahogany.

The Dining Room

Considering the fact that from the dining room a pleasant outlook on an artistic garden may be had, we suggest that the walls be paneled to a height of seven feet with walnut strips and a neat moulding on top. The spaces between the strips should be divided in symmetrical panels which are covered with a two-toned gray and soft blue grasscloth, with a little gold fleck in it. The space above the panelling and the ceiling should be in white. For the floor, an Oriental rug would look charming, but one could use a figured domestic rug in the same tones as the curtains and walls. The hangings may be in French blue Sundour silk.

For furniture we would suggest a dining room suite in walnut.

The Kitchen

The kitchen floor should be covered with a blue and white block linoleum cemented down. All woodwork in this room should be finished in white enamel. The kitchen wall may be blocked off into a tile effect wainscot and this finished heavily in white enamel. The wall space above the wainscot may be in Alice blue and the ceiling in a lighter shade of blue. The kitchen range of blue and white enamel, does not cost any more than the ugly black ones. The double window over the sink may be made a feature of the room with blue and white checked gingham curtains.

The Living Porch

The living porch can be very attractively furnished with a few black wicker chairs, table and artistic bird cage. The couch-hammock and chairs may be upholstered in cretonne—gray and mulberry, to harmonize with the living room.

The Laundry

The laundry has been situated in the basement and partitioned off with plastered walls and ceiling tinted in cream. It would be well to equip it with all modern conveniences.

The Bathroom

For the bathroom we would suggest the use of Meteor gray tile for the floor and wainscot. This will give a very good background for the white enamel fixtures. Above the wainscot the wall should be tinted a light Colonial gray in a flat finish oil paint, and the ceiling white in flat oil colors.

Bedroom No. 1

The furniture in this room, which may be used as the main bedroom, is suggested to be of mahogany. The walls would look well in a gray figured wall paper. Soft blue-gray silk overdrapes would be pretty at the windows. The floor may be covered with small Chinese rugs of blue and yellow, or the same color carried out in a chenille Wilton. The wood trim in this room finished in white enamel with the doors in mahogany.

Bedroom No. 2

The walls may be tinted or papered in pale green with the trim in old ivory and the doors tinted in a pale green the same as the walls. The mouldings of the door and cornice may be striped in Terre Verte as this will give a pleasing contrast. The furniture in this room may be a bedroom set of rich ivory, with the lines and beads green and blue and painted with a design of field flowers in baskets. For the floor we would suggest several small rugs, carrying out the same color scheme as the walls and furniture with a faint suggestion of pink flowers to correspond with the painted designs on the furniture. The hangings in this room may be of ivory colored scrim with an edging of pale green.

Bedroom No. 3

This bedroom may be fitted up as the son's room. The walls would look well finished in a light tan figured paper. The trim would be best finished in fumed oak and the furniture also of fumed oak, consisting of a chiffonier with mirror, a day bed, a good sized desk, and a comfortable easy chair. For the floor a small Oriental rug would give a desired touch of color; for hangings cream colored rep with a soft brown edging would look well.

Landscaping the Home Grounds

How to Obtain Pleasing Garden Views from the House at Small Cost

By GRACE V. PEKER

WHEN the house is finished, its appearance can be greatly enhanced by a simple landscaping of the grounds. Two important points should be considered; the appearance of the house and grounds from the street, and the view from the inside of house to the grounds.

For occupants of the house, it is more important to have a good view from the windows than to have your garden give a correct appearance from the street. A garden is observed from the house, therefore care should be taken so that pleasing vistas will be had from any window and the porch. It is comparatively easy to obtain this effect, and at a very moderate cost.

The diagram below shows a 60x100 ft. plot on which the modern cottage shown on another page, has been built. Particular care has been taken so as to obtain a pleasing view from the dining room, since it will be observed that the best view is from this point. A key with the diagram gives the names of the different plants, trees, and shrubs that can be used in order to give a succession of bloom. These will cost but little.

In designing the planting, avoid straight lines as much as possible. Note that in this layout the different plants seem to converge together, ending at a two-seated pergola near the rear, with some tall trees in back.

This is a little scheme in perspective that will add an appearance of depth to the lot. In other words, the same principles that are used in making scenes for a stage have been carried out here. All points should vanish in the distance, and your plants can be arranged so as to secure this effect.

Tall trees should be at the rear and in corners. Then some high shrubs, next lower ones, and in the foreground either annuals or perennial flowers. In this way one secures an appearance of height, but the plants should not be placed in regular order. Here and there a break can be made by inserting a high plant or tree, which rises from the lower ones. A few rocks correctly placed so as to avoid an artificial look, will add a pleasing touch to the garden.

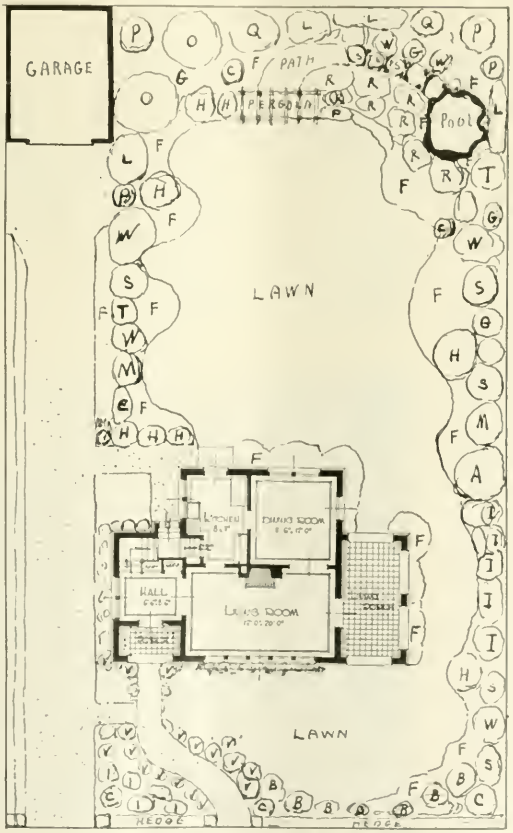
A path of stone with a few stone steps leads to a sunken pool of concrete hid among shrubs, the backs of this pool are covered with ferns, ivy, iris, funkia, etc.; just a pretty little nook that will come as a surprise to the visitor. The garage is practically hidden from view.

Key to Planting

A = Arbor Vitae Eligatissima (Golden tipped)
B = Barberry
C = Red Cedar (10 to 12 feet tall)
E = Alathea (Rose of Sharon)
F = Flowers in variety (annuals and perennials)
G = Forsythia (golden bell)
H = Hydrangea
I = Rosa Rogusa
L = Lilac
M = Magnolia
O = Oak (12-14 feet high)
P = Lombardy Poplar (18-20 feet high)
Q = Maple (12-14 feet high)
R = Rhododendrons
S = Spirea Van Houttei (Bridal Wreath)
T = Philadelphus (Mock Orange)
V = Evergreens in variety; dwarf arbor vitae, spruce, pines, yew, ilex, hemlock, retinospora, etc.
W = Weigelia Eva Rathke

Vines for Pergola

Wisteria
Honeysuckle
Clematis
Boston Ivy



Suggestion for Landscaping a 60 x 100-Foot Plot

Perennials for Sections F

Columbine, Anemone, Coneflower, Hollyhocks, Iris, Phlox, tall; Phlox, dwarf; Larkspur, Sweet William, Fox Glove, Golden Glow, Coreopsis, Blanket Flower, Shasta Daisy, Forget-Me-Not, Day Lily, Funkia, Lily-of the Valley, Bleeding Heart, Poppy, etc.

Annuals for Sections F

Geraniums, Petunias, Zinnias, Asters, Alyssum, Cosmos, Heliotrope, Candytuft, Portulaca, Marigolds, Verbena, Begonias, Coxcombs, Ice Plant, Pansies, Salvia, Balsam, Ageratum, Nasturtiums, etc.

Quantity Survey of Modern Cottage

(Continued from page 25)

CARPENTRY

Timber—All No. 1 common stock, hemlock, rough unless noted.		
Cellar girders—		
6" x 10" spruce—1/16, 1/8	120	F.B.M.
2" x 3" nailer—46 lin. ft.	23	F.B.M.
Wall plates—		
3" x 8"—2/18, 2/14, 4/12, 3/10	284	F.B.M.
Posts—		
4" x 6"—6/10	180	F.B.M.
Studs, girts and plates, 1st floor—		
2" x 4"—24/16	246	F.B.M.
Studs, etc., 2nd floor—		
2" x 4"—100/16	1,067	F.B.M.
1st floor joists—		
2" x 10"—18/14, 27/12	960	F.B.M.
2nd floor joists—		
2" x 10"—54/14	1,260	F.B.M.
2nd floor ceiling joists—		
2" x 6"—48/14	672	F.B.M.
Rafters		
2" x 6"—9/16, 42/14	734	F.B.M.
Hips and ridge		
2" x 8"—4/18, 1/10	110	F.B.M.
Framing for hood, etc.		
2" x 4"—45/12	360	F.B.M.
Floor bridging		
2" x 3"—250 lin. ft.	125	F.B.M.
Cellar partitions		
2" x 4"—12/14	112	F.B.M.
Sheathing (7/8" x 8" shiplap)		
Walls—to cover	724	sq. ft.
Flat roofs—to cover	88	sq. ft.
Sheathing paper (waterproof)	800	sq. ft.
Shingle lath—(7/8" x 3")	1,400	lin. ft.
Grounds (3/4" x 2", surfaced 1 side)	1,800	lin. ft.
Sheathing for cellar partitions (7/8" x 8" shiplap)—to cover	170	sq. ft.
Rough flooring (7/8" x 8" shiplap)		
First and second floors—to cover	1,232	sq. ft.
Furring (7/8" x 2")	200	lin. ft.
Shingle roofs (18" stained shingles)		
136 squares	9,400	shingles.
Shingle sides (24" stained shingles)		
49 squares	1,600	shingles.

Exterior Finish

Hood and first floor cornice:		
5/8" x 3 1/4" M. & B. ceiling—to cover	236	sq. ft.
7/8" x 3" fascia	150	lin. ft.
4" crown moulding	150	lin. ft.
5/8" x 7/8" cove	130	lin. ft.
Main cornice:		
7/8" x 8" soffit	70	lin. ft.
7/8" x 3" fascia	70	lin. ft.
4" crown moulding	70	lin. ft.
5/8" x 7/8" cove	70	lin. ft.
Raking cornice:		
2" cove	54	lin. ft.
Dormer cornice:		
7/8" x 3" soffit	64	lin. ft.
7/8" x 4" fascia	64	lin. ft.
2" mould	64	lin. ft.
7/8" x 2" cap	64	lin. ft.
4" bed mould	64	lin. ft.
Flower boxes:		
(1 1/8" wood boxes lined with zinc)		
12" x 12" x 5' 0" long	1	unit.
12" x 12" x 4' 6" long	2	units.
Porch seat:		
2' 0" wide x 4' 0" long, high back, sawed ends, etc.	1	unit.
Wood brackets for rear porch hood	2	

Exterior Finish

Windows:		
Frames complete with sash, outside trim, etc. Sash 1 1/2" thick, glazed D. T.		
Cellar windows:		
Single top hung sash, casem., 3' 0" x 2' 0", 4 light	3	
Mull. sash, etc. 3' 0" x 2' 0", 4 light	1	
First floor windows:		
Group of five D. H. sash, ea. 2' 4" x 5' 0", 12 light (masonry)	1	
Single D. H. sash, 3' 0" x 5' 0", 16 light (masonry)	1	
Single D. H. sash, 2' 6" x 3' 2", 12 light (frame)	2	
Mull. D. H. sash ea. 2' 6" x 3' 2", 12 light (masonry)	3	
Mull. D. H. sash ea. 2' 10" x 4' 6", 16 light (frame)	3	
Single D. H. sash, 2' 10" x 4' 6", 16 light (frame)	1	
Triplet D. H. sash, ea. 2' 4" x 3' 6", 12 light (frame)	2	
Shutters (1 1/8" thick, solid paneled):		
2' 4" x 5' 1" pr.	1	pr.
3' 0" x 5' 1" pr.	1	pr.
2' 6" x 3' 3" pr.	3	pr.
Blinds (1 1/8" thick, movable louvres):		
2' 10" x 4' 7"	4	pr.
2' 6" x 3' 3"	1	pr.
Exterior door frames (1 3/4" thick rabbeted) complete with outside trim:		
Frame for front ent. door 2' 10" x 6' 10"	1	
Frame for rear ent. door 2' 8" x 7' 2"	1	
Frame for cellar ent. door 2' 6" x 6' 8"	1	
Frame for doors to living porch, 4' 0" x 7' 0"	1	
Exterior doors (all to detail):		
Front ent. door, 2' 10" x 6' 10" x 1 3/4" glazed	1	
Rear ent. door, 2' 8" x 7' 2" x 1 3/4" glazed	1	
Cellar ent. door, 2' 6" x 6' 8" x 1 3/4" glazed	1	
Doors to living porch, pr. ea. 2' 0" x 7' 0" 1 3/4" glazed	1	pr.
Finished flooring:		
Living room, dining room, ent. hall, plain sawed white oak, 13/16" x 2 1/4"—to cover	442	sq. ft.
Kitchen, etc., No. 1 maple, 13/16" x 2 1/4"—to cover	88	sq. ft.
Second story, No. 1 comb grain Y. P. 7/8" x 2 1/4"—to cover	480	sq. ft.
Lining paper under floors	1,100	sq. ft.
Scuttle to attic 3' 0" x 3' 0"	1	unit.
Slat floor under laundry tubs, 3' 0" x 4' 0"	1	unit.
Joist hangers (1/4" x 2" W. I):		
For 2" x 10" beams	8	
For 4" x 10" beams	5	

Interior Finish

(Whitewood unless noted)

Door trim:		
7/8" jambs, 1/2" stops, 7/8" x 4 1/2" moulded and mitered trim with wall moulding. Trim both sides.		
For doors 2' 6" x 6' 8"	5	sets.
For doors 2' 4" x 6' 8"	6	sets.
For doors 2' 0" x 6' 8"	1	set.
For cellar doors (plain) 2' 6" x 6' 6"	1	set.
Trim for inside of exterior doors:		
Front ent. 2' 10" x 6' 10"	1	set.
Rear ent. 2' 8" x 7' 2"	1	set.
Cellar ent. 2' 6" x 6' 8"	1	set.
To living porch 1 pr. 4' 0" x 7' 0"	1	set.
Trimmed openings finished same as for doors:		
Opening 4' 6" x 6' 8"	2	sets.

Interior Finish

Trim for windows:	
⅞" x 4½" moulded and mitered trim with wall moulding, ¼" stops, 1⅛" moulded stool, ⅞" moulded apron, ⅝" x ⅞" cove under stool.	
For windows, group of 5, ea. 2'4" x 5'0"	1 set
For windows, single 3'0" x 5'0"	1 set
For windows, single 2'6" x 3'2"	2 sets
For windows, mull ea. 2'6" x 3'2"	3 sets
For windows, mull. ea. 2'10" x 4'0"	3 sets
For windows, single 2'10" x 4'6"	1 set
For windows, triplet, ea. 2'4" x 3'6"	2 sets
Base:	
⅞" x 6" moulded	420 lm ft
2" base mould	390 lm. ft
½" quarter round at floor	420 lm. ft
Picture moulding ⅝" x 2½"	350 lm ft
Mantel for living room	1 unit.
Seat for hall	1 unit.
Hook strip (7/8" x 4")	50 lm ft
Rabbeted shelf cleat	25 lm ft
1" dia. pipe clothes rod	14 lm. ft
Interior doors:	
(2 cross panel birch veneer)	
Door 2'6" x 6'8" x 1⅜"	5
Door 2'4" x 6'8" x 1⅜"	6
Door 2'0" x 6'8" x 1⅜"	1
Solid pine cellar door 2'0" x 6'6"	1
Whitewood door to plumbing pipes 1'6" x 3'0" (with trim)	1
Closet shelving (7/8" x 12" pine)	30 lm ft
Kitchen cupboard with countershelf, drawers, doors, etc.	
Front 4'0" x 8'0"	1 unit
Main stairs first to second story, 14 risers 3'2" wide, balustrade, etc.	1 flight.
Cellar stairs, 12 risers box pattern	1 flight

General Conditions

Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges

Allow for general work not listed, such as grading, planting, etc.

Include in sub-bids such items as hardware and applying same, painting and decorating, plumbing and gas fitting, heating, electric work, etc.

The Small House

Can Have Many Conveniences at Moderate Cost

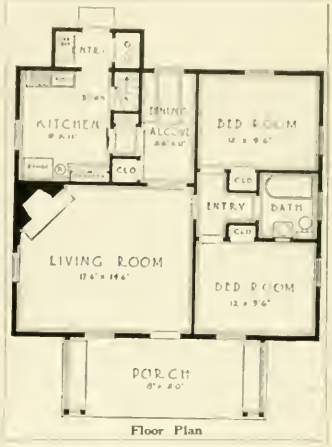
BECAUSE one has a limited amount of money to spend there is no reason why the home should not be artistic in design and convenient in arrangement.

As a practical example of what can be done in this line, we illustrate a pleasing little house on the bungalow order. This contains the necessary conveniences for a small family of refinement. It was built after plans prepared by C. E. Schermerhorn, architect, of Philadelphia, Pa.

The two bedrooms have a bathroom between and in each bedroom there is ample closet room.

A corner fireplace adds a cheery note to this living room. At the rear through a cased opening, one enters the dining alcove. This can be attractively fitted up at very little expense. The window in the rear should, of course, be slightly above the height of table and if a casement window is used, it would add to the attractiveness of this dining nook.

A short passage-way conveniently connects the dining alcove with the kitchen. Two closets are on either side of this passage-way. The kitchen, though small, is well laid out; the range is situated in the corner so



Floor Plan

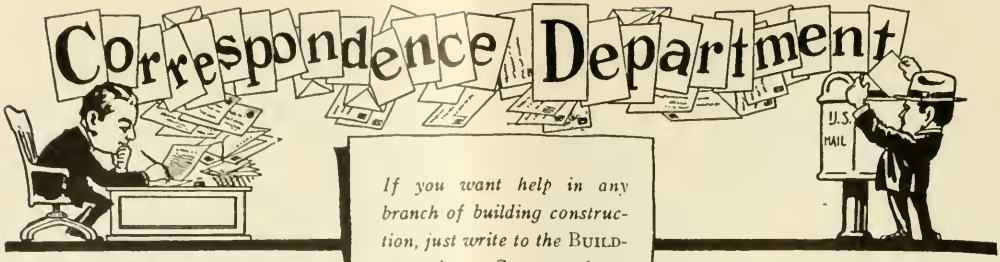


that a direct connection can be had to the chimney. A handy kitchen cupboard is located next to it. On the opposite side is the sink and entrance to the cellar. An entry from the rear leads to the kitchen, on one side; the ice box is conveniently located and opposite is a closet.

The exterior of this house is finished in wide clapboards. The porch is of simple design and the treatment of lattice and seats adds just that touch which stamps it out of the ordinary. There has been real designing here.

A French door at the front forms a pleasing entrance. The little gable windows and shutters also add interesting features to the side elevations.

For those who desire them, BUILDING AGE and THE BUILDERS' JOURNAL can furnish complete blue print plans and specifications at a nominal sum.

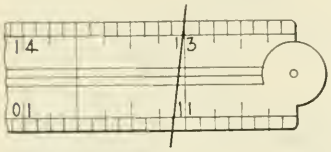


If you want help in any branch of building construction, just write to the BUILDING AGE *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Quick Way to Get Pitch of Window Sills

HERE is a little kink that I know is not generally used because so few are acquainted with it. It is an idea that will be found useful so I am sending you a sketch of it to present to my fellow readers.



Hold a folded two-foot rule with the Figs. 13 inches and 11 inches upright and facing you place a T bevel against the left side, setting the blade at Figs. 13 inches and 10⅞ inches, the rule being one inch wide. This gives you a pitch of ⅛ inch in one inch which is the standard, and the mills get out a stock stool to fit that pitch and stand level. Door sills should be 1/16 inch in 1 inch pitch.—**E. W. Conlee.**

Short Cut in Finding Hopper Bevels

A RECENT issue of BUILDING AGE contains an exposition of the science of obtaining and applying bevels as practiced, it may be presumed, in the institution from which it originates.

It might interest some to know how these problems are solved by workmen in the shop and on the job and it may surprise some to read the statement that their methods of doing work is often impractical and at times impossible on the actual job which is the ultimate goal of their direction, and further, frequently erroneous in presentation to pupil and reading public.

As a text, the contribution to January issue of BUILDING AGE is potential with possibilities of criticism and since BUILDING AGE invites discussions as well as presentations, the following is respectfully submitted.

Fig. 1 shows the most simple, certain and expeditious way of finding a hip bevel on roof board or hopper sheathing. Contrast this method with the process given in your January issue. A toy hopper is the subject and as such is susceptible to a treatment not always applicable to man-size jobs. The process of solution presumes a knowledge of the run (1¾ inch) and rise (3½ inch) from which the bevel is supposed to be developed with a steel square. The figures given for run and rise will not yield the correct bevel but they do reveal, in this instance, the danger of employing in-

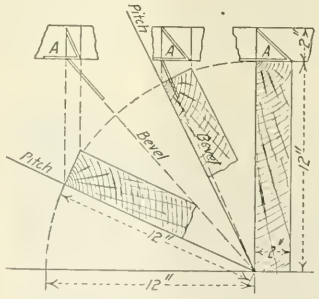


Fig. 1

tricate processes. The plan of this toy hopper shows at once its bevel and the simplest means possible for getting the mitre. Specifications show it is 3½ inch longer on its top line, therefore, 1¾ longer at each upper corner. Any ordinary workman with this data would lay the bend line directly upon the stock with no hesitation. Now, the top edge of this stock is to be worked off so as to present a level surface when in place. This being true, a common mitre square of 45 degrees applied upon this flat surface "develops" the true mitre.

In common experience a workman is assigned to a job of cutting hip or hopper lining with no other data than the pitch or batter of hopper, in this situation his knowledge of the method in the text would not extricate him from his difficulty. Hopper lining—or sheathing, is usually square edge stock and as such a mitre must be found to apply upon

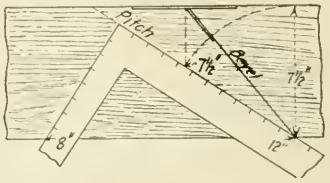


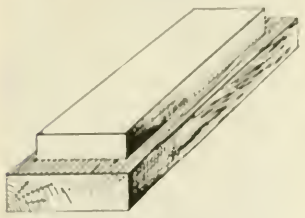
Fig. 2

this square edge. For this purpose Fig. 2 is submitted. If repetition is permissible, remember that any inclined wall with a flat, level surface at its top, is mitred to form a square as though the wall was perpendicular. This disposes of the need of finding such mitres and as for butt joints—they are not practical on any flattened pitch and are tabooed where practicality exists in good work shops. And further, there is always danger of overstocking the average workman's storehouse of knowledge, the result of which tends to confuse and produce errors. And, among all people, there is danger of putting too much before them at one time.—**C. A. Doner.**

Easily Made Mounting for Oil Stones

EVERY oil stone or hone should be mounted by setting in a hardwood box or case mortised out to receive it like the attached sketch. If the stone is one inch deep and one and one-half inches in width and say six or seven inches in length, of a good quality Washita, carborundum, emery stone, it is worthy of a case or boxing. Let the lower box be of oak, cherry or mahogany wood about 1⅛ inch thick and mortised out ½ inch for half of the stone, so it will fit tightly into it level and true. The cover is similarly made and mortised to fit to a close dust-proof

joint and be hinged to the bottom case at one end so as to keep the abrasive surface clean and free from grit or dirt. On the top side of the cover or lid the soft tongue of an old laced shoe may be affixed with cold glue to form as it were a strop to make the edges of



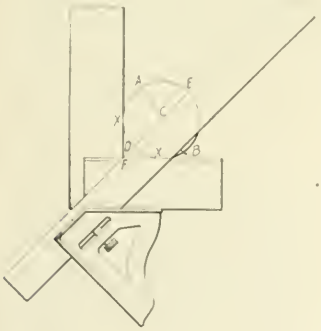
chisels, plane irons, cutters, etc., very keen and remove the wire edges. All should be oiled or polished.

All rectangular, oval or round whet bench stones should be encased or mounted to avoid breakage from falls, etc.—**Owen B. Maginnis.**

Finding the Center

ENCLOSED is a drawing of a little kink that I have found useful in obtaining centers on round work when the ordinary combination square was at hand, but without centering head.

Place the combination square over the trisquare as shown, taking care that the two blades cross exactly at F, the inner corner of the right angle.



Place the two squares on the end of the pole or shaft to be centered, and draw a line across the face of the work. Revolve the shaft, and draw another line. The result will be lines A, B, and D, E, crossing at C, which is the center of the circle.

This same idea can be used in connection with nearly any two try and miter squares, taking care to see each time that the lines drawn across the work, start exactly in the interior angle of the right angle.—**C. E. Kelly.**

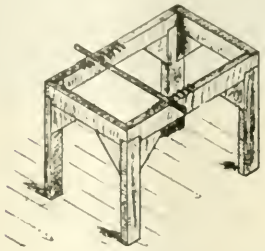
HAVE you ever used any machinery or device which has saved you time and money?

Have you ever invented any way of doing a piece of work quicker?

If you have BUILDING AGE and THE BUILDERS' JOURNAL wants your experience, and will pay regular space rate for it.

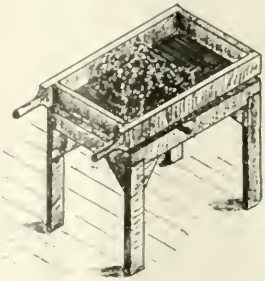
Your description should tell just how you saved time and money, either by a special way of using machinery or by short cuts in construction. Point out what methods you were using before adopting your "Time Saver" and show how your new method turns the trick. You can submit as many articles as you want.

Address The Editor, BUILDING AGE and BUILDERS' JOURNAL 920 Broadway, New York City.



Screening Sand

THE enclosed views show an interesting method of screening sand which we are using on a building here I am sure it will be of interest to many of your readers. A rigid frame is made as indicated by view "A" in the top rail of which small nails (not over 6 penny) are partly driven and then bent over as indicated. A broom handle is placed on top of the frame to act as a roller under the tray. The tray is partly filled with sand and rapidly moved forward and backward on the broom handle roller, which in passing over the nails causes the tray to go up and down sufficiently to cause the sand to rapidly pass through the screen. We find this method better for wet sand than the inclined screen which is commonly used.—**D. W. Daley.**



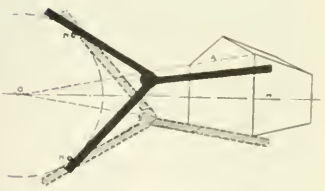
Perspective Drawing Short Cut

IN drawing architectural perspectives, it very frequently occurs that the vanishing point O falls off the paper and beyond the drafting board. The following original device is a contrivance which will save one the laborious task of locating the vanishing point every time a line is drawn.

As shown in the illustration, the device consists of three blades so constructed that the one edge of each blade will pass through the center, if projected. The blades are movable and a thumb screw keeps them in position when they are adjusted. Quite often the vanishing point is beyond the limits of the drawing board, and with this device in use one does not have the difficulty of building out some contrivance on the board to locate the vanishing point.

To use this contrivance, which I have called the Y, only one line from the object to the vanishing point must be drawn. Then insert two nails N so that two of the blades will just touch and move about them. The third blade is made to coincide with the given line A and adjusted so that it also coincides with the horizon line H. By trial it will be very easy to get the Y in the proper position and the nails placed. Care must be taken to see that the proper edge of the blades are used, namely, those which are on center.





The Y device is based on the fact that the nails are on the perimeter of a circle whose center is at O and identical with the vanishing point. Two of the blades are always tangent to the circle and the third blade is parallel to the given line which passes through the center O. Therefore, the device in any position will have the two blades tangent and the third blade in such a position that it will always pass through the center O if projected and all vanishing point lines can be drawn without locating the point O every time.—**Albert Korte.**



Building the Sun Parlor

MODERN homes, to be complete, must have sun parlors or enclosed porches. Frequently, these are so arranged that screens may be used in the summer and sash in the winter. Of course, for winter use, they should be heated and provision should be made for radiators, registers, etc.

The sun parlor can be of any desired shape—square, oblong, round, hexagonal, octagonal, etc.—all will lend themselves to unique treatment so as to produce an artistic result.

The floor of the sun parlor may be of plain wood, or wood covered with canvas or linoleum in plain color or in tile effects. Another plan is to have the floor cemented and blocked off into squares. Tile is frequently used with excellent results. The choice may be for small tile laid in ornamental designs, or large 6x6 inch or 8x8 inch red quarry tiles. The joints may be close together or separated about 1/4 inch apart, and an artistic effect secured by the use of colored mortar. Very often a pretty design is worked by the use of large and small squares.

The walls of the sun parlor should be the same as the house wall which it adjoins. Do not have a stucco wall on the house and then have the three walls of the enclosed porch covered with beaded wainscot. If the walls of the house are of stucco, the walls of the sun parlor should be made the same. Likewise, should the walls be shingled, the interior walls of the sun parlor should also be shingled. To obtain the best artistic result, the walls should be uniform.



In some cases the walls are plastered, and, of course, decorated with wall paper, but this gets away from the porch look entirely and produces another room. When the walls are plastered, they should have a rough finish, and tinted so as to harmonize with the color scheme desired. The walls of the sun parlor are frequently ornamented with lattice.

The ceiling of the sun parlor should, wherever possible, be pitched, that is, a flat ceiling schould be avoided, since this feature makes the porch appear as a room. If the porch is square or oblong in shape, a hipped roof effect may be given to the ceiling. To have the rafters exposed adds to the appearance of the porch.

In furnishing the sun parlor, a good deal of taste can be displayed so as to produce a harmonious result. Some color scheme should be selected and furniture, hangings, rugs, etc., should be arranged with a thought to the proper effect. Wicker furniture seems to be the most desirable for porch use, it can be supplied with cushions of cretonne or plain material to harmonize. Of course, potted plants lend the touch of color that is necessary by way of contrast.

What the Editor Thinks

Helping the Home Seeker

EVERY family that lives in a rented home must pay rent, and this sum may be applied to the purchase of a home of their own. Every family of this sort is a potential possible customer for the building contractor.

Builders should give particular attention to problems of financing construction, which will mean more business for them if they can help out on this end. Local building and loan associations seem to be the proper source from which to obtain necessary funds for building.

It is to the interest of every community to have new permanent residents settle in their midst. Every merchant will reap the benefit of increased trade. It is up to contracting builders to talk to these merchants and show them the advantage of putting their savings in building loan associations so as to build up their town and add to their own prosperity.

1922 looms before the builder as a year of great prospects and prosperity for the building industry. There is a great need for more homes. These in a town mean more stores, schools, churches and a community building, etc. This will create more work for builders. Boost and build up your town—it pays.

Preventing Strikes

THE Associated General Contractors of America, The American Institute of Architects, The Engineering Council, The National Building Trades Employers Association, and the Building Trades Department of the American Federation of Labor, through the National Board for Jurisdictional Awards, have reached a national agreement through a resolution heavily penalizing union workmen who refuse to abide by the decisions of the Board.

The resolution provides that local building trade councils of union labor shall suspend unions and refuse to recognize or support those unions which refuse to abide by decisions of the National Board, also provides that general contractors and sub-contractors who employ only union labor shall incorporate in their agreements with labor a provision that will secure compliance with all the decisions of the Board and that they shall refuse employment to members of local unions which do not abide by such decisions and, further, that architects and engineers shall insert in all their specifications and contracts a clause that such decisions shall be followed.

This resolution is of far reaching consequence to settle these jurisdictional disputes, which in the past have constituted the majority of the causes for strikes and resulting delays and economic losses.

It is the most effective co-operation between workmen, employers, and professional men interested in construction looking toward the settlement of these jurisdictional disputes without resort to strikes.

Home Building Expositions

WIDESPREAD interest in home building is manifested in the large number of building expositions taking place this Spring.

Practically every city of considerable size has had or will have within a short time, an exposition of some sort dealing with the building industry from the "service departments" in the local lumber yard to the large shows in San Francisco, Minneapolis, Chicago, Detroit, Cleveland, Atlanta, Boston, New York, Trenton, Newark, etc.

The Chicago Show, which opened March 25th and closed April 1st, was a big success. At Cleveland, the American Building Exposition opens April 22 and will continue for 10 days in the New Public Auditorium which has just been completed. The New York Show will also open on April 22d. At San Francisco, the Home Beautiful Exposition opens on April 24th. Truly, the month of April is an Own-Your-Home month.

This all indicates that the public is keyed up to the home building situation. Conditions are right now for building and there is every indication that the year 1922 will go down in building history as a boom year for home construction.

Up-to-Date Homes

ONE of the newest developments we have noticed is that of speculative builders advertising a complete house for sale with all modern improvements, including a Radio Telephone Service, a feature that will add greatly to the enjoyment of these new homes.

Several progressive builders around New York and Philadelphia have hit upon this clever idea to create a desire for their homes.

Tax Exemption Extended In New York

THE housing shortage in New York produced the tax exemption law so as to encourage the building of homes. This law provided that buildings erected, or on which the construction was commenced before April 1st, 1922, would be exempt from taxes for a period of ten years. The time limit has just been extended to April 1st, 1923, but the tax exemption period will expire January 1st, 1932.

This extension of the exemption law will tend to further increase the number of houses to be erected this and next year. Many people were unable to make the start last year, but now, under more favorable conditions, they can proceed to build their own homes.

Own-Your-Home A Good Slogan

IMPRESS upon everyone the idea of "Own Your Home." It helps the building contractor by creating more business, the family owning its own home is more content, and it increases the wealth of our country. As this subject is so popular at the present time, we have devoted practically all our space this month to the Own-Your-Home idea.

This issue of BUILDING AGE and THE BUILDER'S JOURNAL is a good one to show prospective home owners who come to you for advice. There are many helpful articles that will give information which should be mutually agreed upon, so that the building contractor can erect for his clients the house best suited to their individual needs.



CARPENTRY

Good Practice in Frame Construction and Finish

How to Find Cuts for Hips and Valleys

Some Practical Points to Be Observed to Prevent Mistakes

By JOHN PARKHILL

MY observation as a practical builder has shown that there are some important points in roof-framing which are very imperfectly understood—or not understood at all—by the majority of builders.

The weather last summer furnished a very warm topic, but the length of a rafter furnished a much warmer one—to our local carpenters.

Ed Marvin, the contractor on Sam Bryan's new house, has very few equals on roof-framing. For Bryan's house the architect, Tom Wade, had specified four by four-inch hip and valley rafters unbacked. On part of this roof two hips and one valley rafter were required, all three having the same rise and run.

From three timbers all of the same length, Ed was preparing to cut these when Tom came along and remarked that these timbers were long enough for the hips, but too short for the valley rafter. Ed disputed this, the discussion waxing warmer until finally Tom said, "Ed, not only is your timber too short for this valley rafter but when you buy one long enough it will cost you as much as both the hips did. We will prove which of us is wrong and let him buy a bully supper for the boys. Do you agree?" Ed agreed—to what he later termed a rash offer.

The point in dispute excited much more interest than the supper did, but both these attractions combined drew a large and most enthusiastic audience, which included the Carpentry teacher at the State University—Mr. Smith.

Tom, after expressing his gratification at the interest shown, displayed a roof plan of the rafters in question, and explained that as the whole rise of the common rafter is 21 inches, and its whole run just one foot, he proposed to prove that the valley rafter must be more than three inches longer than the hip.

"Gee whiz," exploded one young fellow, "if its over three inches longer for just one foot of run what would it be on the main roof?" "Just the same," replied Tom, "this difference remains the same irrespective of the length of the run. Your remark is quite welcome and any others will be."

"In that case," said an experienced builder, "let me say that I always mark the lengths of hip and valley by the same pattern, as I have assumed that if there is any difference in length it is negligible."

"The same here," spoke up three others.

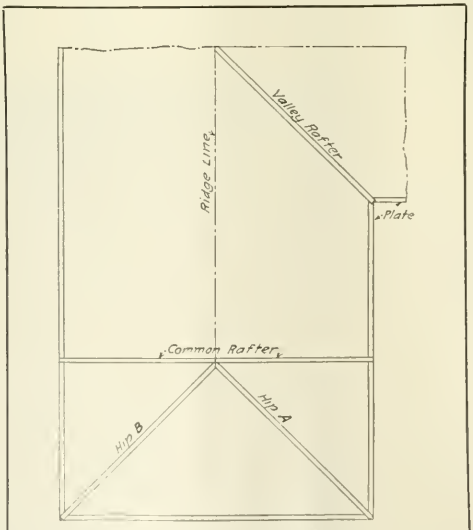


Fig. 1—Showing Common Rafters, Hips and Valley

"I also make these lengths the same," remarked another contractor, "but I always have to chop off the upper corners of the hip for five or six feet at its bottom end."

"Perhaps Professor Smith will tell us what is taught at our University regarding this," requested Tom.

"Please reduce my title to instructor," modestly replied Smith. "Really, this point has not yet come up in our carpentry class. The difference you state seems very surprising and rather unreasonable, but just at present I would not venture to say that you are wrong."

"Tom," said an old veteran, "as this hip and this valley rafter have the same rise and the same run, how then can there be this difference in length?

"That," replied Tom, "is exactly what I am here to demonstrate. Regular, backed-off hip and valley rafters

tor the same rise and run are the same length, and the center line along the top edge of each lies in the same plane as the top edges of the common rafters. This plane coincides with the under side of the roof-sheathing. With unbacked rafters this plane still passes through this center line on valley rafter, but not through that of the hip.

"It passes through the corner of an unbacked hip, and to bring the corner into this plane the hip must be shortened. This may be plainly seen in Fig. 1 where the center line of the valley rafter reaches to the outside edge of the plate but that of hip A does not.

"The length of the hip as you builders say you make it—as perhaps most builders make it—is illustrated by hip B which is shown the same length as the valley rafter, with its center line reaching to outside edge of the plate.

"But it is quite obvious that the corner of hip B on which the sheathing must rest now stands above the plane in which the sheathing belongs—more than two and three-eighths inches above plumb up.

"One" tells us that he remedies this by chopping off the top corners of hip for five or six feet at its bottom end. But why stop at six feet?

"With a straight hip he must chop for its whole length. This, if accurately done, gives a backed-off hip—which is not here specified.

"Contrary to the general belief, it is not difficult to determine this difference in length between unbacked hip and valley rafters as Fig. 2 will help us to see.

Half the thickness of hip from S in Fig. 2, mark a point X on the horizontal cut. Then with S X O a right angle O S is this difference in length, 3.182 inches.

S N is the length of the valley rafter, 27 inches.

O N is the length of hip A, 23.818 inches.

The hip B, as improperly represented in Fig. 1, stands 2.474 inches (equivalent to X O) above its proper position which is shown correctly by hip A in Fig. 1.

The horizontal cut of unbacked hip always lies in O P Fig. 2, while that of the valley rafter lies in S T.

A gauge line through the point X gives the depth of backing. Many advise the backing off of these rafters. I don't because the labor cost is very much more. If not accurately done the rafter is seriously damaged weakened to the extent of more than nineteen per cent in the present instance!

"Now," said Tom, "will my friend Ed tell us whether he still disagrees with me?"

In response Ed got up and said "Tom, since you were at the house I have cut and placed those rafters, and they fit perfectly. I must admit that I was rather surprised to find so much difference in the lengths, but these were just exactly as you have stated them."

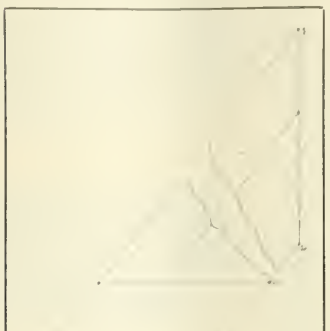


Fig. 2 Showing
Valley Rafter=S N=27 inches long
Hip rafter A=O N=23.818 inches long
Difference in lengths=S O=3.182 inches.
Depth of Backing=X Y
Horizontal cut of Valley Rafter=S T
Horizontal cut of Hip Rafter=O P
Plumb cut of each=NM
Half thickness of Hip=S X=2 inches
X O=2.474 inches
S X O=right angle

"My two-foot timber being too short I had to buy a four-foot piece which, of course, cost me just as much as both the hips did. You gain your point, but what I gain is worth much more to me than what it costs, so I don't envy you the least bit."

"Isn't Ed a good sport," Tom teasingly remarked, "he is the first man I have known to cut a hip rafter properly, and I have planned and superintended many buildings."

"I strongly urge you all to get better acquainted with roof-framing," continued Tom. "It is a fascinating study and will furnish you many surprises.

"For many years the Mormon Tabernacle has furnished an example of a most remarkable roof, as being the largest self-supporting wooden roof in existence. But a roof recently built at Rochester, Minnesota is by far the most remarkable that I have any knowledge of. In this, a plain roof with straight rafters, no ridge board, and with regular hips, the common rafters are longer than the hips."

"Gee whiz, that's a little too strong, Tom," remarked my helper, who had just kept quiet all through this high-brow discussion.

"Yes, I have no doubt that the rest of you feel like 'whizzing' too, but I have a diagram here and I can show—" Here Tom felt a gentle shove and some one earnestly whispered in his ear. "Boys," he resumed, "I can show you the way to supper, it's ready, let's go."

PROBABLY no part in the construction of buildings so thoroughly taxes the skill and ingenuity of the builder as the framing of roofs," says Mr. I. P. Hicks in his book, "The Builders Guide." "Many diagrams have been published from time to time showing how to find the lengths and bevels of hips, valleys, and jacks on all kinds of roofs. Yet many of the plans heretofore published have been too complicated to satisfy the wants of the inexperienced in the art of roof framing."

The lengths and cuts of any rafter, hip, valley or jack on roofs of any pitch may be easily found by a proper application of the steel square and 2-foot rule.

There are a few simple facts which, if remembered, will serve to make hip and valley roof framing so plain and easily understood that no one need have any difficulty in finding the length and cut of any rafter.

The pitch of a roof is always designated by the number of inches it rises to the foot run, hence the cut of a common rafter is always 12 for the bottom cut and for the top cut is the rise of the roof to the foot.

The cut of a corresponding hip or valley of equal pitch is always 17 for the bottom cut and for the top cut the rise of the common rafter, 17 and 8 will cut the hip or valley.

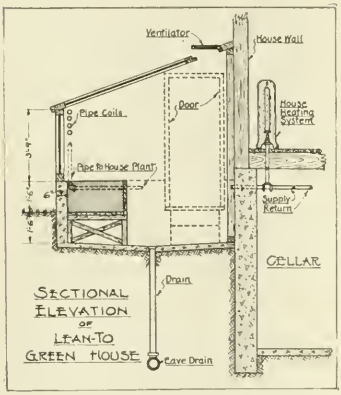
The top bevel of a jack rafter is always 12 on the tongue of a square and the length of the common rafter for a foot run on the blade.

The blade gives the cut. In other words, the run of the common rafter on the tongue and the length on the blade will always give the top bevel of jack rafters on roofs of equal pitch. The plumb cut or down bevel of a jack is always the same as that of the common rafter.

How to Build a Small Greenhouse

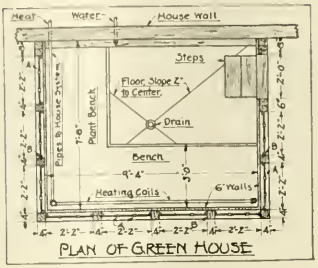
By FRANCIS DASHIELL

THE green house which is described in this article is designed especially for the average home, being constructed of the lean-to type alongside of the dwelling house on a southern exposure. The house wall is to be desired for building the greenhouse beside because of the warmth, protection and the proximity to the heating source. The green house provides the ideal conditions so necessary for the safe keeping of tender or tropical outdoor plants and bushes which must be kept at a temperature above freezing throughout the winter season and



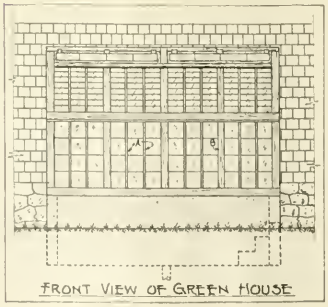
for the forcing and growing of flowers and vegetables under glass.

The greenhouse should be provided with a slight basement eighteen inches below the surface of the existing grade. The foundation walls should be of concrete and six inches in thickness extending 18" above the surface of the ground, making a total inside height of three feet from the floor to the top of the wall. A concrete floor should be made sloping towards the center, a pitch of two inches being sufficient to provide ready drainage. An iron drain fitting with a strainer is set in the center of the floor and connected down to a local drain pipe, such as the eave spout or rain water drain. A door-way opening as shown is provided for on the east end of the foundation wall, or any other position which is protected from the prevailing wind direction.

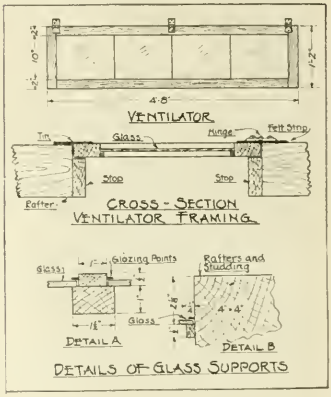


The total outside dimensions of the greenhouse are 10'-4" in length and a width of 8'-2". The front height is 5'-3" and the rear is 8'-7", being taken from the outside ground level. The inside dimensions are 9'-4" by 7'-8" with a height of 6'-9" at the front and 9'-9" at the rear, measuring from the floor level. This provides plenty of clearance all around the inside walls under the rafters of the roof.

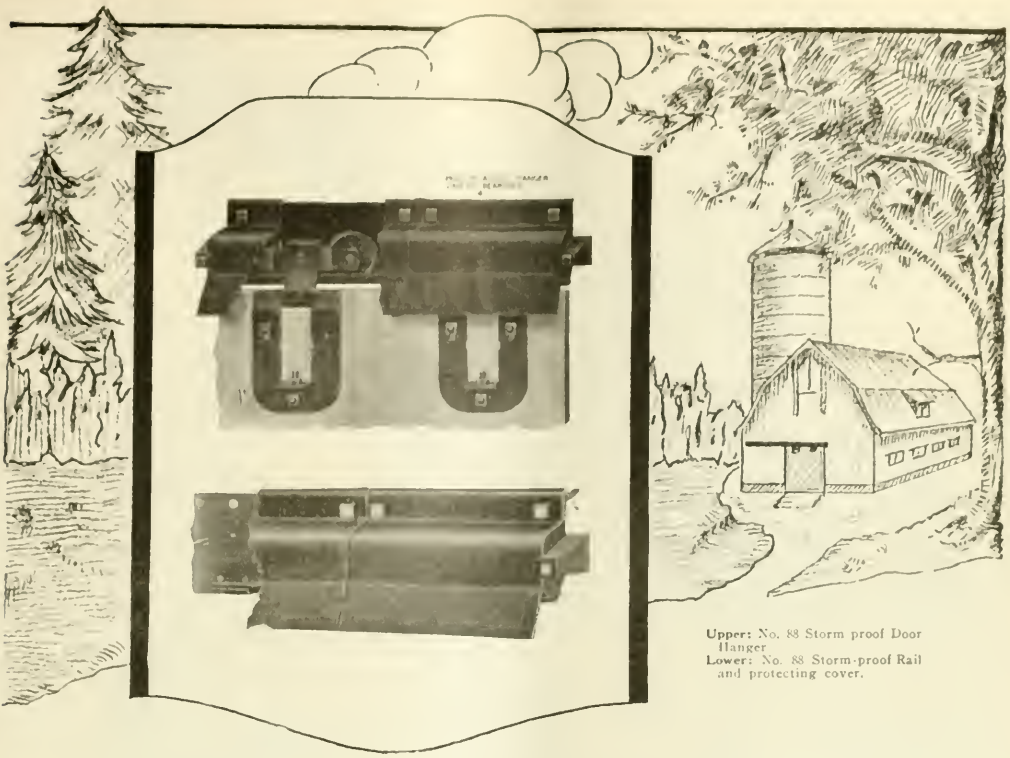
The sills, studding and rafters are of 4" by 4" lumber. This may seem somewhat heavy for this type of construction, but stiffness is required in order to obtain strength as much bracing is impossible. The studding and rafters are set up on 2'-6" centers as shown in the plan. Each of the spaces between them is filled in with three rows of 8" by 10" standard hot bed glass. These panes of glass are carried upon supports made up of two pieces of material of suitable length, one piece being 1" by 1½" and the other ½" by 1". These two are nailed together and provide a ¼" supporting surfaces for the glass as shown in Detail "A." The supporting of the glass edges upon the rafters and studding is accomplished by nailing a strip ¼" by ½" along the inner edges or sides of the rafters and studding shown in Detail "B."



Two roof ventilators are necessary and are made as shown in the detail and will require four pieces of glass 10" by 14" to each. These windows should be hinged to the outside of the roof and swing upwards. Suitable hooks should be provided so they may be adjusted from within. The cross section drawing illustrates the method of making the water tight joint between the roof and frames when closed.



The structure must be supplied with heat during the winter and on cold nights. The most simple scheme for heating a green house is by means of a pipe coil. It should be suspended around the outer walls of the house and connected to the main house heating plant. These connections can be made through the basement wall to the nearest lines of risers of supply and return mains in the cellar. The pipe coil in the green house must be placed at a somewhat higher level than the supply pipes in the basement so as to allow for



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proper drainage. The radiation for this building is approximately 100 square feet. Very often during the day the heat will have to be turned off as the rays of the sun will provide all necessary heat. The addition of this small quantity of radiation to the house plant should not be harmful, as all plants are designed with allowances for overload in case of additions to the installation.

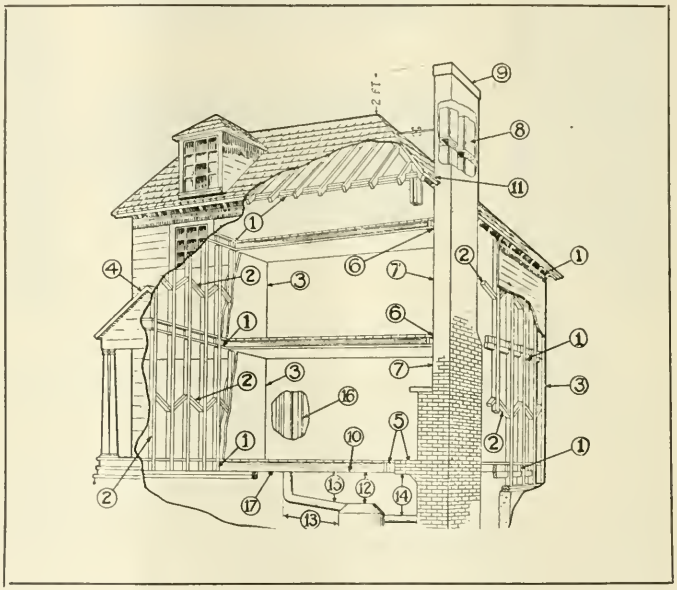
A box or bench is built all around the sides of the house and filled with rich brown loam for growing the plants and vegetables in. Suitable hooks and shelves are to be placed to take care of potted and hanging plants. A ½" water line from the cellar and fitted with a faucet is useful for watering the vegetation in the mornings with a fine spray from a hoze nozzle.

Fresh air admitted to a green house daily is a necessity, except during very bad weather. The proper use of the ventilators and the door will soon be learned after practice. A thermo-electric device for regulating the heating coil valve will be a valuable addition towards lessening the labor of operating the green house and will do much towards keeping the temperature uniform.

Construction Diagram of Fire Resistive Frame Houses

DURING the past year the most competent engineers in the lumber industry have been working out improved designs in frame construction with a view chiefly to the reduction of the fire hazard to a minimum. So successful has been this work that the authoritative announcement has just been made that through better building methods, and at very little increased cost, the danger from fire in frame houses has been reduced 50 per cent by reason of improvements in construction. In all respects these houses are similar in appearance to those of usual construction, but they possess many, and for the most part hidden, protective features that make them essentially fire resistive.

The accompanying diagram graphically illustrates many of these modifications in construction. It will be observed by noting the numbers indicated and the reference below, that fire stopping is of primary importance. This means the interposing of panels and short pieces within spaces that ordinarily serve as flues for rapid spread of combustion. Most of the other improvements are protective in their nature and prevent wooden parts catching fire from chimneys, fire places, heating plants, steam and hot water pipes, etc. While, of course, wood will burn, it is also true that there is no such thing as a "fireproof" house within the reach of the ordinary pocketbook. What is now offered is an economical type of construction that is fire resistive and as nearly fireproof as frame construction as now developed can be made. It conforms strictly to the scientific building codes of the most progressive cities and carries a minimum of fire risk to the occupants.



(1) Fire stopping at all intersections of walls and partitions with floors, ceilings and roof.

(2) Herring bone fire stopping in partitions midway between floor levels.

(3) Partition and wall corners framed solid.

(4) Wall between porch attic, and house sheathed solid.

(5) Header beams 20 inches from the fireplace breast. Incombustible hearth.

(6) Wood members 2 inches from chimney, space between filled with loose incombustible material.

(7) Plaster applied directly to chimney breast.

(8) Flue lining in chimneys.

(9) Top of chimney 2 feet above peak of roof.

(10) Protection over heating plant.

(11) Roof framing 2 inches from chimney, flashed, permitting free movement of chimney.

(12) Top of heating plant 15 inches from ceiling.

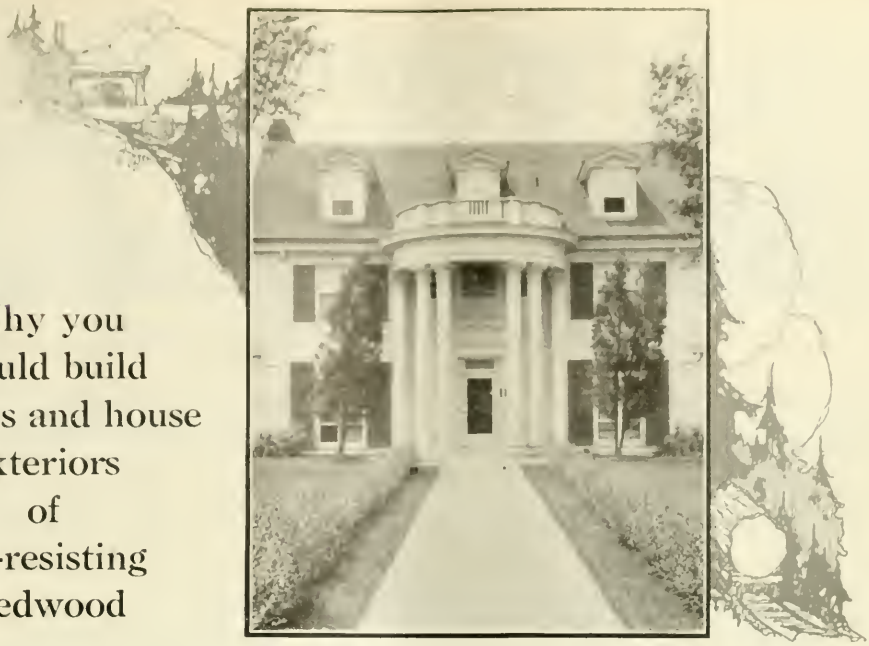
(13) Furnace 8 feet from warm air riser.

(14) Smoke pipe 1½ times its diameter below the ceiling.

(15) Heat pipes 6 inches below ceiling.

(16) Doubled tin pipes, 1½-inch air space between in partitions, kept 1 inch from all woodwork. Steam and hot water pipes 1 inch from woodwork.

(17) Heat pipes running through floors. fire stopped with asbestos, etc.



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Pickets and fencing.
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Interior Finish
Natural, stained or painted.

Industrial Uses
Tanks and vats for water, chemicals and oil.
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Such as Caskets and burial boxes.
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Such as Railroad ties and tunnel timbers.
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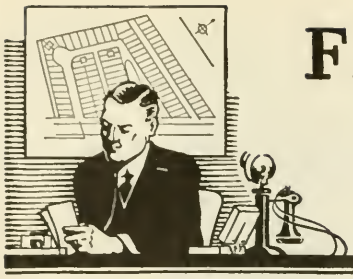
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Helpful Data for the Builder Who Builds to Sell

Financing Home Ownership

BUSINESS methods should prevail in home building, as well as in other thnigs. Many people have been ruined financially in trying to own a home of their own simply because fundamental business principles were entirely neglected.

The greatest fault is to attempt to own a place that is too large and costly to keep up. People that have been cooped up in a three or four-room apartment for ten to twenty years get the idea that they can own a home of their own at less money than they are paying as rent to a profiteering landlord, which is true, but then they expect to have a ten-room house with extensive grounds, garage, etc.

It costs money to own a home of your own and this should be carefully considered in relation to one's income. One should have a reasonable amount of money to begin with as it will, therefore, cost less to carry it.

A very sensible plan of figuring is to put down all the items of expense, including interest on the money you have invested. This will actually show you how much your house is going to cost.

It is a wise plan to mark down the items of cost in the following form:

Interest on investment.....$.....
Interest on mortgages.....$.....
Taxes and assessments.....$.....
Dues to local improvement Association .....$.....
Repairs .....$.....
Insurance .....$.....
Depreciation .....$.....

Total annual cost of upkeep $.....

If you add these items up the result will be the total annual cost of your house. If you have enough cash on hand to pay for everything, of course, the problem of financing need not be considered, but very few are fortunate to be in this condition.

The simplest plan of financing is to obtain a first mortgage as it is termed, on the property and building. If a sum up to 50 per cent. of the combined value of the lot and building is desired, there is usually no trouble in obtaining the loan.

Where, however, one has a limited amount of money a Building Loan Association seems to offer the best possible way of financing a home. In nearly every locality you will find some Building Loan Association and they will always be willing to make a loan if the investment seems desirable.

Building Loan Associations

IN the majority of Building Loan Associations the member pays $1 per month for each $100, or $10 per month for each $1,000 borrowed, and continues the same monthly payment until the loan is fully paid. From this monthly payment interest at six per cent. on the amount of the loan is deducted and the balance is applied directly as a payment on the principal. The following month, the sum deducted for interest is less than the preceding month, while the sum credited to the shares of the loan is greater. By this system the borrower reduces his interest charges monthly, and while he continues to make the same monthly payment, he is charged interest each month only on the actual amount of his loan still unpaid.

By this method a loan is paid for in 139 months or 11 years and 7 months. This looks like a long time at the start but time will fly fast enough. One must remember that the rent is due every month if one continues to live in a rented home.

Under the monthly payment plan the time of total payment is fixed, and there is no cost or annoyance of renewal as is the case with a straight mortgage for a few years. The Building Loan Association plan does not interfere with the sale of property in any way as the mortgage can be reduced to any amount, or paid in full at any time.

Monthly payments on building loans are required only on the sums actually advanced, and the full payment does not commence until the house is completed. The cost of obtaining a loan including mortgage tax, and all expenses, is from $100.00 upwards. The applicant is required to furnish a survey of the property in all cases.

Here are figures of a person paying, say, $30 per month, buying a house for $4,000. If he should buy the property, paying $1,500 cash, and take a Building Loan Association Mortgage for $2,500, the result would be:

Paid Cash	$1,500.00
Paid $25.00 per month on mortgage for eleven years and seven months	3,475.00
Taxes	440.00
Repairs and Fire Insurance	550.00
	5,965.00
Deduct rent, he would have paid same length of time	4,170.00
And the home has cost only	$1,795.00

In other words, a $4,000 house has been bought for $1,795 and that is certainly a good business investment.



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Legal Department

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age and the Builders' Journal, 920 Broadway, New York City.

A BUILDER from New Jersey writes for information concerning his legal rights under the following states of facts. He negotiated to construct a building and furnished a set of plans, but it seems that no final or signed contract was entered into. The owner later misrepresented to the builder that the real estate had been sold; thereby apparently inducing the builder to reconcile himself to loss of the contract. But still later the owner, or rather his wife whom we infer to be the real owner of the property, contracted with another builder for erection of the building. The plans mentioned were copied and filed with the municipal tenement house department. The architect copied the plans because informed that settlement had been made by the owner with the first builder. The question presented is what redress is available to the first builder. Is he entitled to loss of profits through having let other work go in order that he might be in position to complete the proposed work on time?

Rights of a Builder Where His Plans Are Used

So far as loss of the construction work is concerned the law applying is clear and simple. If no definite and final contract was entered into there is no valid claim for loss of contemplated profits in erecting the building. Until such a contract is finally made there is no mutually binding obligation. The builder may freely terminate the negotiations and decline the work. And the owner has the reciprocal right to refuse to proceed, without regard to his reasons for doing so. Until a final and definite contract is entered into the builder takes the risk of losing all time and expense incurred in seeking to secure the contract, no matter how great may be the loss to him.

As to the plans used by the owner we believe that a valid claim may be enforced against the husband and wife jointly for the reasonable value of the work done by the first builder and so accepted in the erection of the building by the second builder. Counsel for the first builder will find a summary of the law on this subject at pages 260-263, 5 Corpus Juris.

The first builder would probably have had no valid claim had the plans been rejected or had the owner wholly abandoned the proposed building. But we believe that the first builder has a valid claim against the owner or owners for the fair value of the services rendered by him and actually used in the construction of the building by the second builder.

IN the recent case of Reynolds & Maginn vs. Omaha General Iron Works (180 N. W. 584) plaintiffs were awarded damages for breach of a contract to furnish structural steel, etc., to plaintiff contractors for use in erecting a school building in Nebraska.

Validity of Informal Contracts

Among other points decided by the Nebraska Supreme Court in affirming the judgment, it is decided that a letter by a dealer in building materials, sent to a contractor and stating that in the event of the contractor becoming the successful bidder for work the dealer will furnish the required materials at certain prices becomes a valid contract on the contractor accepting its terms.

And, as applying to cases where all the terms of an agreement have been informally agreed upon but a formal contract contemplated by the parties has not been actually entered into, the court follows the rule laid down by the Appellate Division of the New York Supreme Court:

"The law undoubtedly is that an informal agreement complete in its terms will take effect if the parties so intend, though a more formal contract is expected to be afterwards made, provided that the formal contract is not to contain material provisions not contained in or to be inferred from the preliminary informal agreement."

IN the case of Wright vs. McAdams Lumber Co., 234 Southwestern Reporter, 878, the Texas Supreme Court approves a conclusion of the Commission of Appeals of the state, to the effect that the act passed by the Texas Legislature in 1915, providing that "no change or alteration in the plans, building, construction or method of payment shall in any way avoid or affect the liability" on a contractor's bond, is void as unconstitutionally interfering with the right of freedom to contract. So it is found that the law remains unchanged in Texas that a material change in the terms of a building contract, without the assent of the contractor's surety, relieves the surety from libiality. The opinion reaffirms the rule stated in 21 Ruling Case Law, 1004, par. 53:

Liability of Surety Where Builder's Contract Is Changed

"The contract of the surety . . . . demands that he be dealt with in the utmost fairness and good faith. He cannot, therefore, either at law or in equity, be bound further or otherwise than he is by the very terms of his contract, and if the parties to the original contract think proper to change the terms of it without his consent (which, it is not disputed, they have a right to do), he is discharged. When his contract is changed without his knowledge or authority, it becomes a new contract and is invalid, because it is deficient in the essential element of consent."

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Speaking of the contract before the court, the opinion adds:

"Neither the contract nor bond contains a provision authorizing the changing of the contract without the consent of the sureties, except that the original contract provides that the owner might make any alteration by adding, or deviating from the plans, drawing, and specifications of the architects he should deem proper and the architects should advise. Clearly the exception limits the alteration to the plans, drawing, and specifications by the architects, and has no reference to changes otherwise."

The court holds that the sureties in this case were discharged by changes in the building contract involved, whereby the contractor was obligated to hasten performance and the price was changed; these changes being made without the consent of the sureties.

Proving Value of Architect's Services

THE necessity for making specific proof of the value of architectural services when it is sought to recover compensation for such services by suit is indicated in an interesting case recently before the Wisconsin Supreme Court. (Tullgren vs. Karger, 181 N. W. 232.) It is held that the ordinary bases of an architect's charges are not so generally known as to enable a judge or juror to fix a basis where none has been expressly proved in the trial of the cast. The court goes farther by saying that the fact that the judge or jurors might have personal knowledge on the subject could not be used as a substitute for specific proof.

It seems that after plaintiffs, Milwaukee architects, had rendered preliminary services, including consultations, drawing sketches, plans, etc., and receiving proposals for the construction of the building projected by defendants, defendants abandoned the idea of building. Dispute arose as to what amount was due plaintiffs for their services, and suit followed. Defendants tendered judgment for $200, but the offer was rejected, and the case was tried. The trial judge found that $1,750 was due plaintiffs, but the Supreme Court has reversed this judgment, holding that plaintiffs, by failing to prove the value of the services rendered, precluded themselves from recovering more than the $200 which defendants had offered to pay.

The theory of the higher court's holding is that proof offered on the part of the architects that it was customary in Milwaukee to pay architects 3½% upon the approximate cost of the building involved was unavailable as a basis for awarding compensation in this case, because the services rendered were not of the nature covered by the usual 3½% contract. The court said:

"It was of course incumbent upon plaintiff if entitled to recover under either theory of the case to present to the court competent evidence upon which a proper assessment of damages might be made. . . . The value of such services as were here rendered by plaintiffs was not a subject of general knowledge, or such as come within the wide field wherein courts take judicial notice of certain classes of facts. The very nature of plaintiff's evidence as to the value of such services shows that the proper proof of the measure of compensation in such matters is peculiarly one requiring the evidence of those familiar as experts with such work and the customary pay therefor in the particular locality where rendered. . . . Though a trial court has particular personal knowledge or experience in such line of work from which he would be qualified to form a judgment upon such a matter, even then such particular personal experience could not be used as a basis for making such a finding. Neither jurors nor trial courts in arriving at their conclusions of fact in any particular case can properly act upon their special individual knowledge as to matters which are not of common knowledge."

To What Extent Is An Architect An Owner's Agent?

AN architect is not, simply as such, a general agent," declared the Washington Supreme Court in the recent case of Columbia Security Co. vs. Aetna Accident & Liability Co., 183 Pacific Reporter, 137.

Plaintiff, owner of a building at Pullman, Wash., contracted to have it remodeled. The contractor gave a bond to indemnify plaintiff against labor and material claims. Plaintiff was required to pay certain materialmen's claims to protect the property from liens, and sued to hold defendant as surety on the bond. The trial judge denied recovery, and plaintiff appealed to the Supreme Court, which has reversed the judgment, directing that plaintiff recover on the bond.

One of the defenses relied upon by the surety company was that it had been relieved from liability, because, without its consent, the plans and specifications had been so changed as to increase the contract price more than twenty per cent. of the amount called for by the bond. But the Supreme Court overrules this claim, on the ground that any such change was made by the supervising architect without the owner's knowledge or consent. It is held that action of an architect not authorized by the owner is not binding on the latter.

The opinion quotes clauses in the building contract, under which the work was to be done according to "the direction of said architect," and reciting that materials condemned by the architect should be removed, and that the architect's "decision in matters concerning the intent and meaning in interpreting drawings and specifications shall be final," etc. It then appears that the changes made at the instance of the architect consisted in the substitution of larger iron beams than were called for by the contract and specifications. The owner was not apprised of this change until the beams were being installed, and it was not practicable to have them removed. In this view of the case, the opinion says:

"An architect is not, simply as such, a general agent. He and all third persons dealing with him are bound by the general rules of agency. In the present case he had no authority to bind plaintiff [the owner] beyond the terms of the contract with Schuster [the contractor]. The authority conferred was limited and defined. It was special and not general. The work to be done under the direction of the architect was the work mentioned in the contract which in the respect in question was made definite and certain by the specifications. His power to condemn and order taken down and removed from the grounds all material as unsound or improper, or as in any way failing to conform to the drawings and specifications, falls far short of giving him any right to recast the drawings and specifications, upon a matter already perfectly clear and explicit, by substituting something else so increasing the total cost that standing alone would threaten, if not defeat, his employer's rights under the literal terms of a bond given to indemnify and assure the employer that the cost of the work would not exceed the amount mentioned in the contract. It was provided that all materials should conform to the specifications, that is, the specifications which were a part of the contract; and, while it was agreed that the decision of the architect in interpreting the intent and meaning of the drawings and specifications of the work under his supervision should be final and binding, this cannot be considered as creating a sphere wherein the architect could make radical changes in the specifications, already precise and certain, to the substantial disadvantage of the owner of the building.

"'The mere fact that a person is employed as an architect does not constitute such person a general agent of his employer, his powers being limited by the contract entered into between them. Thus, unless specially authorized, he is not entitled to change, alter, or modify the contract entered into by the builder and his employer; nor has he any authority to bind the owner by contracts for any work done upon or materials furnished for the structures concerning which he is employed; nor is he entitled to receive notice of an assignment of payments accruing on the contract, so as to charge the owner with notice thereof.'"

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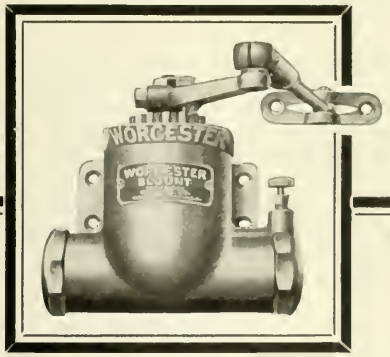
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Review of the Building Situation

BUILDING in 1922 is certainly going to set a very high record according to figures just published by F. W. Dodge & Co., showing contracts awarded in February, 1922; also building projects contemplated for the same period.

According to these figures, as given below, February construction was 73 per cent. greater in volume than it was in the corresponding month of last year! The total amount of contracts awarded (not contemplated) amounted to a total of $177,472,900, which is an increase of 7 per cent. over the total for January, and this is the second largest total recorded in our statistics.

Perhaps the most significant feature of these figures is the large increase in the amount being spent for business buildings over that recorded in January, being 65 per cent. greater than the contracts awarded for business buildings in January. It is certainly a healthy sign of returning confidence in business. The amount to be spent for business buildings figures to 22 per cent. of the month's total contracts awarded, which is an unusually high percentage for this class of building.

Residential building is still in the lead, since $75,727,500,000 of the total amount is for home construction awarded during the month, this is 43 per cent. of the total. The contracts for this sum were for 5,846 separate buildings for residential purposes, bringing the average cost to $12,750. These figures, of course, would also include two or more family dwellings.

The greatest activity is disclosed in the figures for the New York District. There being a considerable increase over the January statistics. The figure of $59,328,500 is the largest February total recorded for this district. It is 9 per cent. over that for January and is 250 per cent. greater than the figure for February, 1921.

This vast sum of $38,374,000, amounting to 65 per cent. of the total, is for residential construction alone!

In the Northeastern states the total amount for residential construction awarded in February amounted to $55,094,100 or 72 per cent. of the entire total for residential construction. This vast sum is but an indication of the immense amount of business that will be handled by builders in the Eastern states for home construction this year. Conditions today are more favorable for the economical construction of building than they have been for many years. Of course, conditions will never be exactly right in the building industry or in any other industry for that matter. But today we find an abundance of labor and an adequate supply of material at a comparatively reasonable price. The money market is also more favorable for financing building operation.

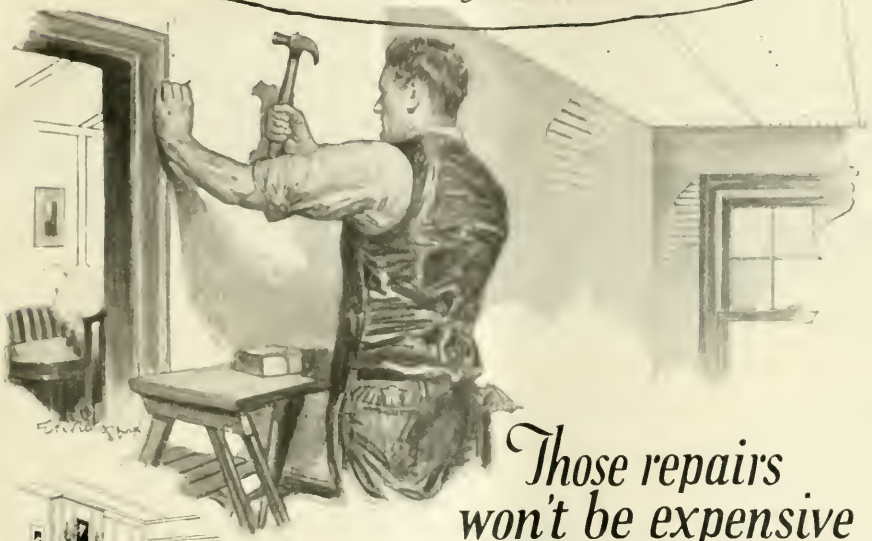
Record of February 1922, Contracts Awarded

Classification of Buildings	SECTION OF COUNTRY						
	New England District	New York District	Mid. Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business Buildings	$7,115,000	$10,117,000	$3,987,200	$8,104,500	$9,622,200	$293,900	$39,239,800
Educational Buildings	1,599,000	2,099,400	440,700	1,908,000	5,210,100	1,853,000	13,110,200
Hospitals and Institutions	160,000	524,800	3,268,000	831,200	2,735,000	230,000	7,749,000
Industrial Buildings	1,041,100	2,851,300	2,310,300	2,098,500	2,400,500	31,500	10,733,200
Military and Naval Buildings	20,000	25,000	20,000	2,500	100,000	26,000	193,500
Public Buildings	15,000	57,000	70,500	19,000	190,000	353,000	704,500
Public Works and Public Utilities	568,700	2,570,400	3,589,700	3,579,100	9,776,800	1,107,900	21,192,600
Religious and Memorial Buildings	301,500	1,670,000	751,000	1,167,000	912,500	80,000	4,882,000
Residential Buildings	4,463,100	38,374,000	12,257,000	6,726,700	12,732,100	904,600	75,727,500
Social and Recreational Buildings	340,000	1,039,600	423,000	553,000	1,579,000	6,000	3,940,600
Total	$15,623,400	$59,328,500	$27,387,400	$24,989,500	$45,258,200	$4,885,900	$177,472,900

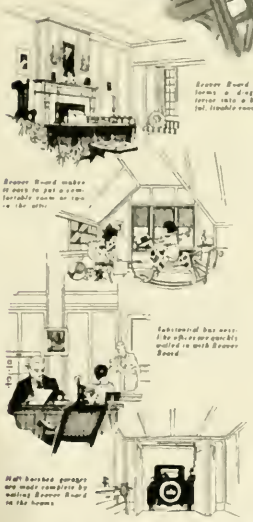
Building Projects Contemplated February, 1922

Classification of Buildings	SECTION OF COUNTRY						
	New England District	New York District	Mid. Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business Buildings	$11,503,000	$9,559,500	$4,382,700	$4,714,000	$22,962,300	$1,635,000	$54,756,500
Educational Buildings	9,321,600	2,772,500	2,926,600	3,856,000	8,694,100	2,177,500	29,748,300
Hospitals and Institutions	560,000	561,400	420,000	1,075,500	3,552,000	530,000	6,698,900
Industrial Buildings	2,077,100	5,135,400	2,175,500	3,145,500	10,977,000	281,500	23,792,000
Military and Naval Buildings	601,000	30,000	20,000	2,500	265,000	5,000	923,500
Public Buildings	113,500	126,000	588,000	494,000	1,952,000	1,255,000	4,528,500
Public Works and Public Utilities	6,415,700	6,664,500	23,917,000	10,233,500	38,277,100	6,083,800	91,591,600
Religious and Memorial Buildings	1,144,500	1,165,000	1,335,500	2,200,000	4,097,000	400,000	10,342,000
Residential Buildings	8,624,000	54,066,700	25,448,100	19,334,800	32,931,500	2,553,200	142,959,100
Social and Recreational Buildings	3,387,000	2,051,600	829,500	1,757,000	4,161,000	152,000	12,338,100
Total	$43,748,200	$82,132,600	$62,042,900	$46,812,800	$127,869,000	$15,073,000	$377,678,500

Here's the second advertisement in the big Beaver Board Campaign—Saturday Evening Post April 1st. It's an Action getter for live contractors and carpenters. Are you all set? If not get busy. Write our nearest office for details of our plan for securing the business.



Those repairs won't be expensive



NOT if you use genuine Beaver Board. The cost of Beaver Boarding is surprisingly low, yet the results are as permanent as they are good looking.

You can nail the big panels over old plaster or directly to joists and studding as easily as you would in finishing up new interiors. Either way you can count on a job that's eminently satisfactory. For Beaver Board walls and ceilings can't crack or fall.

Genuine Beaver Board is knotless, flawless manufactured lumber, made from the long, tough fibers of white spruce logs. Each panel is sized by our *patented Sealtite process*, which makes a perfect painting surface.

Nail up the panels, paint, if you care to decorate, add the finishing wood strips and the job is complete. It's quick, clean work, with little sawing and practically no waste. There's none of the muss or litter that goes along with ordinary repair work.

So, don't postpone needed repairs or remodeling work because you fear the trouble or expense. Your local carpenter or lumber dealer will gladly estimate the cost of the Beaver Boarding you want to do. See about it today.

Or, send our Builders' Service Department in Buffalo a rough sketch, giving dimensions, locating doors and windows and specifying the type of room, and our expert designers will prepare finished plans at no cost or obligation to you.

THE BEAVER BOARD COMPANIES

Administration Offices, Buffalo, N. Y.; Thorold, Ont., Canada; London, Eng
District Sales Offices at New York, Atlanta, Buffalo, Chicago and Kansas City.

Above all, be sure you use genuine Beaver Board. Look for the Beaver Quality trade-mark on the back of each panel. It is there for your protection. Insist upon seeing it.

BEAVER QUALITY

BEAVER BOARD

FOR BETTER WALLS & CEILINGS

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	March 28
LONG LEAF YELLOW PINE	
B. and Better Edge Grain Flooring, 2½" Face	$79.00
Dimensions, S1S1E, No. 1 Common, 2x4", 10'	38.00
Timbers, Merchantable, '05, 12x12", 10 to 20'	49.50
B. and Better Ceiling, ½x3¼	42.50
B. and Better Finish, 1x4"	64.00
No. 1 Common Boards, 1x8"	38.00
NORTH CAROLINA PINE—	
No. 2 and Better Flooring, 13/16x2½"	$67.00
Roofers, 13/16x5½"	29.00
DOUGLAS FIR—	
No. 2 Clear and Better V. G. Flooring, 1x3"	$79.00
No. 1 Clear V. G. Flooring, 1x4"	76.00
No. 2 Clear and Better Ceiling, ½x4"	45.00
No. 2 Clear and Better Novelty Siding, 1x6"	54.00
No. 2 Clear and Better V. G. Stepping	90.12
Dimension, S1S1E, 2x4", 16'	40.00
Timbers, S1S1E, 12x12", 16'	54.00
WESTERN RED CEDAR—	
B. C. Perfection Shingles, per M	$7.40
Washington Perfection Shingles, per M	7.18
Clear Bevel Siding, ½x6"	43.50
CANADIAN SPRUCE—	
No. 1 Lath, 1½"	$8.75
Dimension, 2x4", 10 to 16'	39.00
HARDWOOD FLOORING—	
Clear Quartered White Oak, 13/16x2x2¼"	159.50
Clear Plain White Oak	115.00
Clear Maple, 13/16x2¼"	96.50
(All lumber prices furnished by National Lumber Merchant)	
COMMON BRICK—	
Per M. f. o. b. job	$19.50
PORTLAND CEMENT—	
Bbls. in car lots to contractors, delivered	$2.25
STRUCTURAL STEEL (IRON AGE)—	
Per 100 lb. to large buyers	$1.83
CRUSHED STONE (cu. yd.)—	
¾ in.	$2.75
1½ in.	2.60
WALL BOARD—	
Per 1,000 sq. ft. in lots under 1,000 sq. ft.	$50.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.	45.00
METAL LATH—	
2.3 lb.—26 gauge price per 100 sq. yd. delivered	$18.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered	20.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	23.00
Add 5 cents per sq. yd. for galvanized.	
LIME (Hydrate)—	
Finishing, per 50 lb. bag	$0.60
Masons, per 50 lb. bag	.45
SAND AND GRAVEL—	
Sand (per cubic yard)	$1.55
¾ in. Gravel (per cubic yard)	2.80
1½ in. Gravel (per cubic yard)	2.80
FACE BRICK—	
Tapestry (delivered)	$45.00
Caledonian (delivered)	40.50
Smooth Grey (delivered)	50.00
Fisk Lock f. o. b. factory	32.50
SHINGLES—	
Asphalt, Single (per square)	$8.50
Asphalt, Strip (per square)	6.75
STAINED WOOD SHINGLES—	
16 in. Extra Clear (per square, delivered)	$10.50
18 in. Eureka (per square, delivered)	10.60
18 in. Perfection (per square, delivered)	11.65
24 in. Royal (per square, delivered)	11.00
24 in. Imperial (per square, delivered)	11.70
VITRIFIED SEWER PIPE—	
4 in. (cents per foot)	10½c.
6 in. (cents per foot)	15½c.
SLATE ROOFING—	
Bangor or Slatington, 8 x 16 in. (per sq. at quarry)	$17.50
CORNER BEADS—(Galvanized)—	
Per Foot	$0.06
WALL TIES—(Galvanized)—	
Per Thousand	$5.00
FLUE LINING—	
8½ x 8½ in., Per Foot	$0.27½
8½ x 13 in., Per Foot	.40
HOLLOW TILE—	
8 x 12 x 12 in., Each	.22
HAIR	
Per Bushel	$0.60
PLASTER BOARD—	
32 x 36 x 48 in., Each	$0.23
MAGNESITE STUCCO—	
Per Ton	$70.00
TILE—	
1 in. Square or Hexagon, White, per sq. ft.	$0.30
3 x 6 in. White Wall	.65
8 x 8 in. Red Floor	.50

CHICAGO PRICES

	March 28
YELLOW PINE—	
Boards, 1x8, No. 1 Com	$38.00
Casing and Base, 6-8 in.	64.00
Ceiling, ½x4, B. and Btr.	43.00
Dimension No. 1, 2x4, 12 to 14 ft	31.00
Drop Siding, 1x6, B. and Btr.	48.00
Finish, 1x4, B. and Btr.	60.00
Flooring, B. and Btr. E. G., 1x3	70.00
Lath, 4 ft., No. 1	6.65
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	41.50
HARDWOODS—	
Maple Flooring, 13/16x2¼, clear	$94.75
Oak Flooring, ¾x2, Cl. Pl., White	75.00
REDWOOD—	
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear	$38.25
Finish, S2S or S4S, 1x6 to 8 in. clear	81.50
WESTERN RED CEDAR—	
Bevel Siding, ½x4 in., Clear	$38.75
Shingles, Extra Clears, 16 in.	4.60
COMMON BRICK—	
Per M. f. o. b. job	$12.00
PORTLAND CEMENT—	
Bbls. in car lots to contractors, not including containers	$1.97
STRUCTURAL STEEL—	
Per 100 lbs. to large buyers	$1.83
CRUSHED STONE (cu. yd.)—	
¾ in.	$2.00
1½ in.	2.00
WALL BOARD—	
Per 1,000 sq. ft. in lots 1 M to 2½ M	45.00
Per 1,000 sq. ft. in lots under M	50.00
SAND AND GRAVEL—	
Sand (per cubic yard)	$2.00
¾ in. Gravel (per cubic yard)	2.00
1½ in. Gravel (per cubic yard)	2.00

ST. LOUIS PRICES

	March 28
YELLOW PINE—	
Boards, No. 1 Com., 1x4	$31.50
Partition, ¼x3¼, B. and Btr.	55.00
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	29.00
Finish, S2S, B. and Btr., 1x4, 6 & 8 ft.	56.00
Flooring, B. and Btr., E. G., 1x3	70.25
Flooring, B. and Btr., F. G., 1x3	57.50
Lath, 4 ft., No. 1	6.05
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft	35.00
CALIFORNIA REDWOOD—	
Finish, S2S, Cl., 1x6 in.	$81.50
Siding, 4 in. Bevel, 10 to 20 ft	38.25
8 inch Colonial	66.75
8 inch Bungalow	68.75
HARDWOODS—	
Oak Flooring, ¾x1½ and 2 in., Clear Qtr. White	$113.25
Maple Flooring, 13/16x2¼ in., Clear	101.75
RED CEDAR—	
Siding, ½x6, Clear	$41.00
Shingles, Clears	4.51
COMMON BRICK—	
Per M., f. o. b. job	16.00
PORTLAND CEMENT—	
Bbls. in car lots to contractors, not including containers	2.10
STRUCTURAL STEEL—	
Per 100 pounds to large buyers	$1.92
CRUSHED STONE (cu. yd.)—	
¾ in.	$1.83
1½ in.	1.83
WALL BOARD—	
Per 1,000 sq. ft. in lots under M	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M	45.00
SAND AND GRAVEL—	
Sand (per cubic yard)	$1.10
¾ in. Gravel (per cubic yard)	1.30
1½ in. Gravel (per cubic yard)	1.25

BUILDING AGE

AND

THE BUILDERS' JOURNAL

NEW YORK, MAY, 1922



University Homes

Interesting Community Development in Baltimore

HOMES that are built in groups by speculative builders, unfortunately, in the majority of cases, have a certain sameness that is monotonous. It, therefore is certainly interesting to find a group development that has been carried out with variety in design. Of course, for the sake of economy, one standard plan is usually adopted for use in all houses.

The above picture shows an interesting group of buildings called "University Homes" by its developer, Mr. George R. Morris of Baltimore, Md. This development is located at Canterbury Road and 39th Street, Baltimore, within a short riding distance from the heart of the city. The original property was the farm and garden of one of the old-tashioned large country houses. Mr. Morris laid out streets, put in sewers, sidewalks, curbs, gutters, underground electric service, water, etc. Also a rear driveway for automobiles and rather than wait for the city to pave the streets, this was also done.



An Inviting Front Entrance to a University Home

Mr. Morris was an architect by profession, who branched out as a speculative builder, and is now one of the leading operators in Baltimore. He is the designer of the buildings of "University Homes." He operates his own construction department; all the work on "University Homes," besides his other building projects, were all undertaken by his own organization. Different items, however, were let out to contractors, such as plumbing, electrical work, heating, etc.

Of course, by buying in large quantities and erecting in a wholesale manner, many savings were possible that would be entirely out of the question in the erection of one or even a few houses.

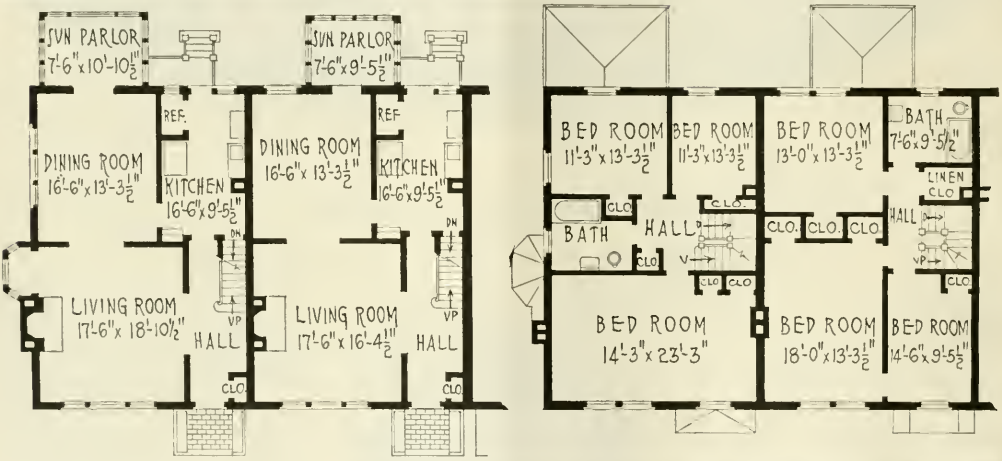
"University Homes" were built to meet the desires of apartment dwellers for a real home of their own, which contained all the conveniences of an apartment house. Mr. Morris conceived the idea of this unique development as the result of



On the other hand, the great disadvantage of an apartment life, even though in a measure the heating troubles are done away with, is the dependency upon the efficiency of a janitor, which, on an average, is not very high.

The apartment, of course, lacks the privacy of the individual home, and most important of all, the apartment house dweller loses the wonderful stimulus that home ownership creates.

In attempting to bring about the desired result in these homes the designer first eliminated the disagreeable features of heating by installing a steam heating plant, fired by gas and automatically regulated by a thermostat which needs no attention. The hot water is also provided in the same manner.



many years' experience in the designing and operating of apartment houses, as well as building a great many individual homes. In his contact with many renters, he learned just what features they desired the most. An effort was made to combine the advantages of both home and apartment, and at the same time eliminate the disadvantages of both.

The objections made to the individual home are the labor and responsibility of operation, such as care of the furnace, which entails a disagreeable job of handling ashes, the disposal of garbage, and other things of that sort. These are the things which drive people into renting apartments.



The always disagreeable matter of garbage and rubbish is overcome by the installation of the most modern and only efficient garbage incinerator.

The apartment house dweller is usually put to a great deal of inconvenience by his inability to secure garage-space near his residence. Each one of the "University Homes" has a garage built in the basement—fireproof, heated and lighted.

The houses are built in groups of two or three. The exterior of every group is a little different from the others, and there are certain changes in details on each house, so that practically every house is different. The floor plans, however, remain practically the same.

The editor of BUILDING AGE and THE BUILDERS' JOURNAL recently visited Baltimore and obtained a number of pictures of these homes. We show three of the different varieties in this issue—half brick and half timber, all stucco, stucco and brick. Many of the houses erected are of all brick; one of these we will show in a future issue, together with the interesting story of how Mr. Morris sold his houses.

As shown on the floor plans, one enters the hall and on one side is a convenient coat closet, and the kitchen is located directly at the rear. Opening from the hall is a good-sized living room, practically square in shape; a large brick open fireplace forms an interesting feature of this room. In the end houses, as shown on the floor plan, a little ornamental bay window is an added feature to the living room.







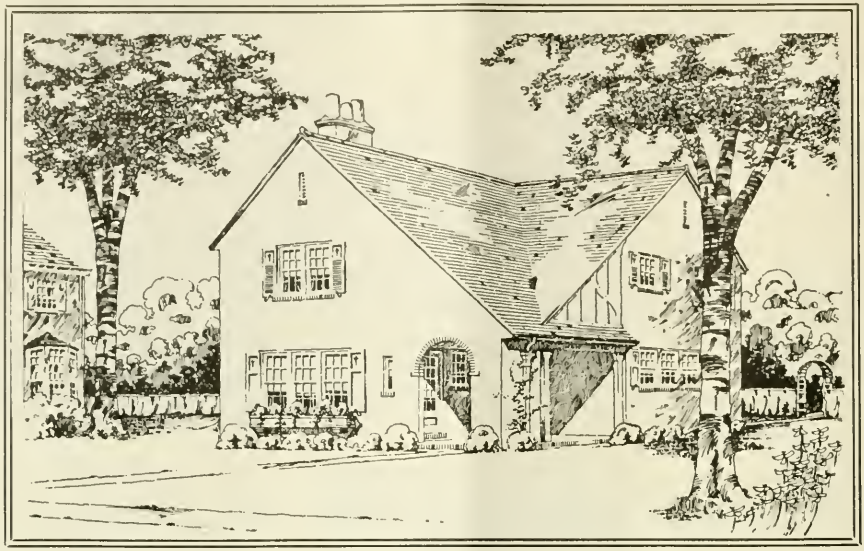
The dining room is reached from the living room through a wide-cased opening. To the rear of the dining room is a sun parlor, closed off with French doors. This affords plenty of light to the dining room. On the end houses the dining rooms have windows on the sides as well as to the rear.

The kitchen is well laid out and planned, so that the work is most conveniently done. Plenty of closet room has been provided, and the cellar is easily reached directly from the kitchen.

Upstairs there are three bedrooms very conveniently laid out, with a minimum of hall space. The stairs extend to the attic, which is supplied with dormer windows, both front and rear, allowing for two additional bedrooms besides storage space. A very interesting feature of the attic is a cedar-lined storage closet.

All rooms have been provided with a number of electric outlets, so that different electrical devices can be easily attached. The bathroom is provided with the regular necessary fixtures, together with shower bath, glass shelves, towel bars, etc.

The cellar contains the laundry and garage. The garage is quite a feature of these houses. It is reached by a driveway placed at the rear of the houses. Our one picture shows the details very clearly; notice in this picture how the ice box drain has been run into the leader, this is a little idea that can be used in many cases.



Conservative Little Home

Six Room House Specially Designed for Readers of Building Age and The Builders' Journal

By R. C. HUNTER & BRO., Architects

MOST of us like houses that appear substantial. Masonry construction with stucco finish and with simple detail gives one just this effect.

Then, too, the substantial house has a number of practical features that argue well for its adoption. First, there is the item of maintenance and repairs, a very important one, then there is the item of fire protection and insurance, together with the selling factor in case one decides to dispose of their house a few years after it is built. All point to good sound construction and conservative design.

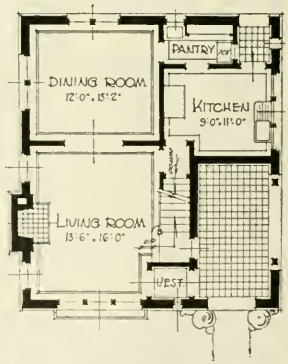
In this little house the architects combine, with a substantial and attractive exterior, all of the advantages of a well laid out and economical plan, along conservative, practical lines.

Though none of the rooms are what one might care to call large, they are all of uniformly good size, providing comfortable living quarters for the average family. There is ample space for all of the required furnishings without cramping.

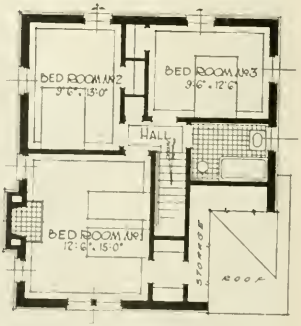
One enters the house through the porch into a small vestibule, the usual hall being eliminated. This arrangement gives over all space to the living room where it is most desired, while the vestibule gives privacy at the entrance that would be lacking should one enter directly into the living room.

The stairs form a decorative feature on one side of the living room with the fireplace opposite.

A group of windows that occupies the full length of one side of the kitchen gives plenty of light where it is most needed. The complete equipment of the kitchen and the adjoining pantry gives assurance that the



First Floor Plan



Second Floor Plan

"business end" of the house has not been overlooked. It has been laid out for convenience, comfort and economy. The heater room, laundry and storage space are located in the well laid out cellar.

The second floor has three good bedrooms and a bath. The bath is tiled and the tub is built in, giving not only an attractive appearance but also saving time in cleaning. The hall has been reduced to a size that allows room for the necessary doors to the various rooms and the required free space, but no more. This allows the room to be given over to more useful space such as the bedrooms. The small hall also shortens steps to the bathroom both from the bed rooms and from the stairs so that it is readily reached from the first floor.

Cost to build, about $7,800. Complete working plans and specifications of this house will be furnished for a nominal sum by BUILDING AGE AND BUILDERS' JOURNAL.

Quantity Survey *of* Conservative Little Home

(*Shown on preceding page*)

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc. Minor outs have been disregarded.

Such items as clearing site, temporary work and protections, scaffolding and general equipment and supplies have not been included.

Such items as are marked "Unit" are to be estimated in a lump sum, following requirements of plans and specifications.

Excavation

(Excavation for pipe trenches not included)

Excavation for cellar	189 cu. yds.
Excavation for footings	16 cu. yds.
Excavation for areas	13 cu. yds.
Excavation for leader drains and dry wells	9 cu. yds.
Excavation for trench walls	14 cu. yds.
Backfilling around walls, etc	34 cu. yds.
Leader drains and dry wells:	
Field stone for dry wells	5 cu. yds.
4" Salt glazed tile drain pipe	24 lin. ft.
4" Elbows	4.

Masonry

Concrete work:	
Concrete for cellar walls	800 cu. ft.
Concrete for footings	290 cu. ft.
Concrete for trench walls	68 cu. ft.
Concrete for area walls	218 cu. ft.
Cellar floor (3" concrete and 1" cement finish)	560 sq. ft.
Area bottoms (brick and sand)	42 sq. ft.
Outside cellar steps (concrete cem. faced)	45 sq. ft.
Porch floors (12" cinders, 3" conc. and brick finish)	116 sq. ft.
Concrete forms	2300 sq. ft.
Reinf. conc. window lintels, concrete	60 cu. ft.
½" Sq. Steel Rods:	
10'-0" long	4.
7'-0" long	2.
⅜" Sq. Steel Rods	
4' 0" long	22.
Pointing cellar window sills	19 lin. ft.

Hollow Tile

8" x 12" x 12" block (or 1200 blocks)	1200 sq. ft.
10" x 12" x 12" block	120 blocks.
4" x 12" x 12" block for corners	80 blocks.
8" jamb blocks	150.
1" leveling slab	60.

Brick Work

Common brick work for chimney (Or 6 M.)	300 cu. ft.
Face brick for sills, etc	600 brick
Face brick for fireplace hearth and jambs. (or 224 brick)	32 sq. ft.
Fire brick for fireplace. (or 200 brick)	40 sq. ft.
12" dia. T. C. flue lining	80 lin. ft.
6" dia. T. C. Ash chute lining	14 lin. ft.

Masons' Iron Work

Fireplace damper (3' 0" opg. with throat, etc.)	1 unit
Fireplace damper (2' 8" opg. with throat, etc.)	1 unit
C. I. Ash dumps	2 units
C. I. cleanout door for ash pit (16"x12")	1 unit
C. I. cleanout door for boiler flue (8"x8").	1 unit
Thimble for boiler flue (8" dia.)	1 unit
Anchor bolts for wall plate (¾" dia. x 24" long with 4" washer and nut)	34.

Plastering

Three coat Patent plaster on wood lath, Gross (Net 310 sq. yds.)	390 sq. yds.
Three coat Patent plaster on hollow tile, Gross (Net 97 sq. yds.)	135 sq. yds.
Dampproofing under stucco....Net	2200 sq. ft.
Stucco on hollow tile, etc....Gross (Net 220 sq. yds.)	260 sq. yds.
Stucco on metal lath	21 sq. yds.
Cast concrete brackets for flower boxes	2 units
G. I. corner beads	60 lin. ft.

Tile Work

Tile work for bathroom:	
Floor (1" hex. white)	38 sq. ft.
Wainscot (3" x6" white wall tile)	140 sq. ft.
6" base	14 lin. ft.
Cap	33 lin. ft.

Sheet Metal Work

Tin flashings for roofs, etc	11 lin. ft.
Tin flashing and counterflashing for chimney, etc.	10 lin. ft.
Chimney cricket	8 sq. ft.
Tin Valley lining	34 lin. ft.
4" half round hanging gutter (galvanized iron)	70 lin. ft.
3"x4" G. I. leaders	9 lin. ft.
Bends for same	2.
Ornamental heads	1.
Gutter thimbles	1.
3" dia. tin leaders	54 lin. ft.
Bends for same	6.
Gutter thimbles	3.
3"x4" G. I. gas range vent	21 lin. ft.
Cap and thimble for same	1.

Carpentry

Timber:	
All No. 1 common stock, hemlock, rough unless noted.	
Cellar girders:	
6"x10" spruce—1/18, 1/12	150 F.B.M.
2"x3" nailer—52 lin. ft.	27 F.B.M.
Wall plates:	
3"x8"—2/16, 1/14, 6/12, 1/8	252 F.B.M.
Studs, girts and plates, 1st floor:	
2"x4"—32/16	342 F.B.M.
Studs, etc., 2nd floor:	
2"x4"—47/16	500 F.B.M.
1st floor joists:	
2"x10"—21/14, 12/12	730 F.B.M.
2nd floor joists:	
2"x10"—22/14, 11/12, 7/10	894 F.B.M.

Carpentry—continued

2nd floor ceiling joists:	
2"x6"—17/14, 9/12, 9/10	436 F.B.M.
Rafters:	
2"x6"—52/12	625 F.B.M.
Hips and ridge:	
2"x8"—4/12, 2/10	91 F.B.M.
Valleys:	
3"x8"—2/18	72 F.B.M.
Floor bridging:	
2"x3"—250 lin. ft.	125 F.B.M.
Cellar partitions:	
2"x4"—14/14	132 F.B.M.
Sheathing (7/8"x8" shiplap):	
Walls—to cover	112 sq. ft.
Sheathing paper (waterproof)	150 sq. ft.
Shingle lath (7/8"x3")	2700 lin. ft.
Grounds (3/4"x2", surfaced one side)	1700 lin. ft.
Sheathing for cellar partitions (7/8"x8" shiplap)—to cover	215 sq. ft.
Rough flooring (7/8"x8" shiplap) 1st floor —to cover	550 sq. ft.
Furring (7/8"x2")	300 lin. ft.
Shingle roofs (18" stained shingles) 136 squares	8700 shingles

Exterior Finish

Raking cornice:	
7/8"x2½" fascia	64 lin. ft.
5/8"x7/8" strip	64 lin. ft.
Half timber work—7/8"x5"—1/12, 1/14, 3/8	50 lin. ft.
Sawed brackets	2
Flower box:	
(1⅛" wood boxes lined with zinc)	
12"x12"x9'6" long	1 unit
Porch finish:	
7"x7" box. cols. 8'0" long with cap and base (solid stick)	2 units
7"x7" head timber 10'0" long	1 unit
Cellar bulkhead:	
7/8"x6" matched and beaded N. C. pine	65 sq. ft.
5/8"x7/8" cove	20 lin. ft.
Windows:	
Frames complete with sash, outside trim, etc. Sash 1½" thick, glazed D. T.	
Cellar windows:	
Single top hung sash, casem, 3'0"x2'0", 4 light	4
Mull. sash, ea. 3'0"x2'0", 4 light	1
First floor windows:	
Triplet D. H. sash, ea. 2'4"x4'10", 12 light	1
Mull. D. H. sash, ea. 2'4"x4'10", 12 light	1
Single D. H. sash, 2'6"x3'2", 12 light	4
Mul. D. H. sash, ea 2'6"x3'2", 12 light	1
Triplet D. H. sash, ea. 2'6"x3'2", 12 light	1
Single casem. sash, 8"x2'10", 3 light	1
Mull. D. H. sash, ea. 2'4"x4'6", 12 lights	1
Single D. H. sash, 2'4"x4'6", 12 light	2
Single D. H. sash, 2'8"x4'6", 16 light	4
Shutters (1⅛" thick solid paneled):	
2'4"x4'11" pr.	2 pr
2'6"x3'3" pr.	4 pr
Blinds (1⅛" thick, movable louvres, solid upper panel):	
2'4"x4'7" pr.	3 pr
2'6"x3'3" pr.	1 pr
2'8"x4'7" pr.	4 pr
Exterior door frames (1¾" thick rabbeted), complete with outside trim:	
Frame for front ent. door, 2'8"x7'0"	1
Frame for rear ent. door, 2'8"x7'0"	1
Frame for cellar ent. door, 2'10"x6'6"	1
Exterior doors (all to detail):	
Front ent. door, 2'8"x7'0"x1¾"	1
Rear ent. door, 2'8"x7'0"x1¾", glazed	1
Cellar ent. door, 2'10"x6'6"x1¾", 5 cross panel	1
Finished flooring:	
Living room, dining room, ent. vest. plain sawed white oak, 13/16"x2¼"—to cover	370 sq. ft.
Kitchen, etc., No. 1 maple 13/16"x2¼"—to cover	129 sq. ft.
Second story, No. 1 comb grain Y. P., 7/8"x2¼"—to cover	491 sq. ft.
Lining paper under floors	500 sq. ft.
Rear porch floor, 1⅛"x3" cypress—to cover	18 sq. ft.
Slat floor under laundry tubs, 3'0"x4'0"	1 unit
Joist hangers (1/4"x2" W. I.):	
For 2"x10" beams	8
For 4"x10" beams	5
Beam anchors, 3/8"x1½"x18"	28
Cement filled pipe cols. in cellar, 4" dia. x 7'6" long, with caps and bases	2

Interior Finish

(Whitewood unless noted)

Door trim:	
7/8" jambs, 1/2" stops, 7/8"x4½" moulded and mitered trim with wall moulding. Trim both sides.	
For doors, 2'6"x6'8"	6 sets
For doors, 2'4"x6'8"	6 sets
For doors, 2'0"x6'8"	1 set
For cellar doors, etc. (plain), 2'6"x6'6"	2 sets
For door, 2'10"x6'6"	1 set
Trim for inside of exterior doors:	
Front ent., 2'8"x7'0"	1 set
Vest., 2'8"x7'0", both sides	1 set
Rear ent., 2'8"x7'0"	1 set
Trimmed openings finished same as for doors:	
Opg., 5'0"x6'8"	1 set
Trim for windows:	
7/8"x4½" moulded and mitered trim with wall moulding, 1/2" stops, 1⅛" moulded stool, 7/8" moulded apron, 5/8"x7/8" cove under stool.	
For windows, triplet, ea. 2'4"x4'10"	1 set
For windows, mull., ea. 2'4"x4'10"	1 set
For windows, single, 2'6"x3'2"	4 sets
For windows, mull., ea. 2'6"x3'2"	1 set
For windows, triplet, ea. 2'6"x3'2"	1 set
For windows, single, 8"x2'10"	1 set
For windows, mull., ea. 2'4"x4'6"	1 set
For windows, single, 2'4"x4'6"	2 sets
For windows, single, 2'8"x4'6"	4 sets
Base, 7/8"x6", moulded	300 lin. ft.
Base, 7/8"x4", plain	50 lin. ft.
2" base mould	300 lin. ft.
1/2" quarter round at floor	350 lin. ft.
Picture moulding, 7/8"x2¼"	340 lin. ft.
Mantel for living room	1 unit
Interior doors:	
(2 cross panel birch veneer)	
Door, 2'6"x6'8"x1⅛"	6
2'4"x6'8"x1⅛"	6
2'0"x6'8"x1⅛"	1
Glazed vestibule doors, 2'8"x7'0"x1¾"	1
Solid pine cellar door, 2'6"x6'6"x1½"	1
Batten door, 2'6"x6'0"	1
Closet shelving, 7/8"x12" pine	24 lin. ft.
Hook strip (7/8"x4")	14 lin. ft.
Rabbeted shelf cleat	16 lin. ft.
1" dia. pipe clothes rod	10 lin. ft.
Pantry cupboard with countershelf, drawers, doors, etc.:	
Front, 7'0"x8'0"	1 unit
Main stairs, 1st to 2nd story:	
14 risers, 3'2" wide, box pattern, etc.	1 flight
Cellar stairs, 12 risers, box pattern	1 flight

General Conditions

Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges.

Allow for general work not listed, such as grading, planting, etc.

Include sub-bids: Hardware and applying same, painting and decorating, plumbing and gas fitting, heating, electric work.



The House by the Lake

Designed by C. E. SCHERMERHORN, Architect

WHAT could be more truly ideal than the house and its site shown on our front cover, bathed in the soft glow of silvery moonlight?

We show on this page another view of this home, together with floor plans, which will show the arrangement of the different rooms. This house was recently built at Yardley, Pa., from plans prepared by Mr. C. E. Schermerhorn, Architect, of Philadelphia. The house, as pictured, was built of hollow tile covered with stucco.

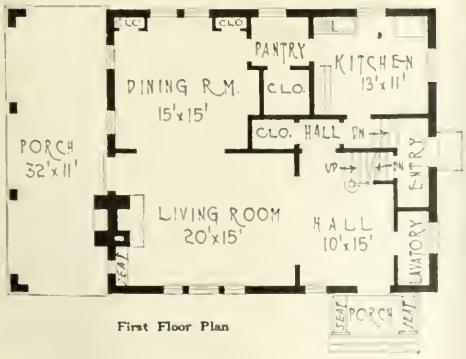
There is a very interesting and convenient layout to this home. Perhaps the one feature that would interest most folks is the extra large porch, which is 11 x 32' in size. This faces directly towards the lake, and from which an inspiring view of the surrounding country can be obtained. A feature of this porch is an open fireplace. From the porch, the dining room and living room are entered.

The lines of the house are very well proportioned, so that it presents a very pleasing appearance. The hood over the front entrance doorway is about the only piece of ornamentation used, the entire beauty of design being obtained by proper proportion and in the symmetrical grouping of the windows.

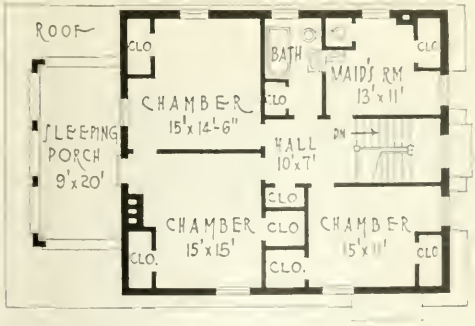
The entrance to the porch has a seat on each side, and the whole effect of this entrance is somewhat along the lines of the Dutch Colonial.

One enters a large 10 x 15 foot reception room. On the right there is a small lavatory, and to the left is a cased opening to the living room. The stairway to the second floor is at the rear of this hall, and off to one side is a large coat closet.

While the rooms are all large, the house is not overlarge, being 32 x 37 feet, exclusive of porch. It certainly is a very interesting example of a convenient home, and its pleasant location certainly makes it an ideal home.



First Floor Plan



Second Floor Plan



Summer Homes *for* Sea Side *and* Country

By CHARLES G. PEKER

BUILDING summer homes is a profitable line of work for the building contractor. These homes are usually of the bungalow order, built for occupancy for a few months of the year only. They seldom have cellars or foundations, outside of posts. In the majority of cases even masonry posts are dispensed with and wood posts are used to support the building.

The ordinary type of a summer bungalow has been rather crude in most localities. At some of the seaside colonies and lake colonies they are nothing more than unattractive-looking shacks and therefore our few designs along this line will be welcomed by builders, as they give something out of the ordinary and at very little added expense.

The summer bungalow is a place to rest and loaf in and everything around it can be fixed with the idea of cutting out work.

Summer bungalow colonies are being built in the vicinity of nearly all large cities; they are usually situated on the shores of some lake or the seaside. The lots are in some cases rather small, necessitating small houses, and another reason why everything is made small for the summer type of bungalow is the expense and the big item of taking care of it.



Mothers and Kiddies Enjoy the Sea Side
That's Why Summer Homes Are Popular

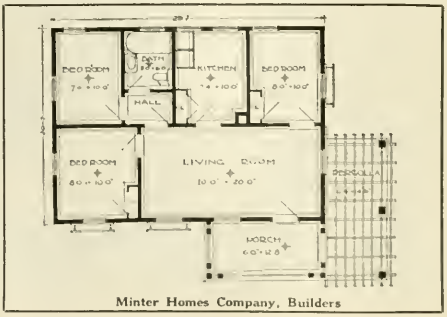
The idea of the summer bungalow is to give one a vacation and therefore everything is cut down as much as possible. The house is merely to give shelter during stormy weather and to sleep in. People going to these places usually live out of doors; still they like a pretty looking place. The alert builder will be ready to give the people what they desire.

The sectional view shows a method of construction that is suitable for building a summer bungalow. This is a good form of construction and while it takes a little more timber than is sometimes used, it gives a neat finish inside, besides making more of a rat and mouse-proof structure.

The construction of a summer bungalow is somewhat radically different from that of a regular all-the-year-round type of building. Being only for summer occupancy it is only necessary that it be rain and wind-tight and sometimes even the wind-tight property is of not very much account.

Many people who have camped in tents are now occupying a more permanent abode, that is, a simple summer bungalow, as it is termed. Quite a number have been erected and in many cases there are, unfortunately, nothing more than shacks, now at but very little added expense they can be made better and have a pretty look, something that one will be proud to own and that will please the lady folks. Everybody likes a good-looking place and if the builder submits a good design he gets the order.

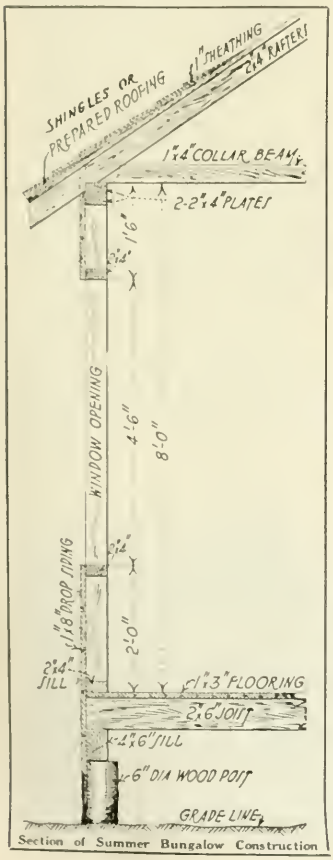




Minter Homes Company, Builders



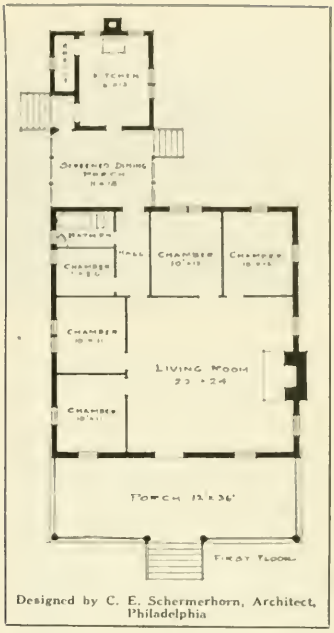
The few pictures shown herewith show how even a cheap summer bungalow can be made an object of beauty at but very slight cost over the ordinary common looking shack.



Section of Summer Bungalow Construction

The first point that is to be considered is the foundation. In practically every case posts will be used; chestnut or locust, about 5 or 6 inches diameter seems to be about the favorite material to be used. These must be set below frost—from 3 to 3½ feet is usually sufficient. It is best to either tar or creosote these before being placed in the ground, but in the majority of cases this is not done. Of course if there are a number of stones lying around it would be best to make the piers of stone. These should be about 14 x 14". Of course, they should go below frost.


Even the Smallest of Bungalows Can Be Attractive in Design



Designed by C. E. Schermerhorn, Architect, Philadelphia

If preferred, brick or hollow tile can be used. One method that we have observed is to use clay pipe about 10" diameter and fill this solid with concrete. Of course, if concrete is used it must be put in molds, or if concrete blocks are to be had they can be used.

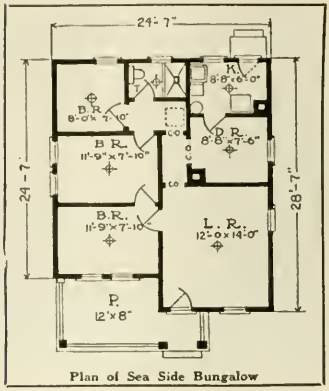
If the bungalow is to be erected on marshy ground a mud sill should be used on which to set the posts. This consists of as big a piece of





Popular Type of Sea Side Bungalow

Minter Homes Company Builders



Plan of Sea Side Bungalow

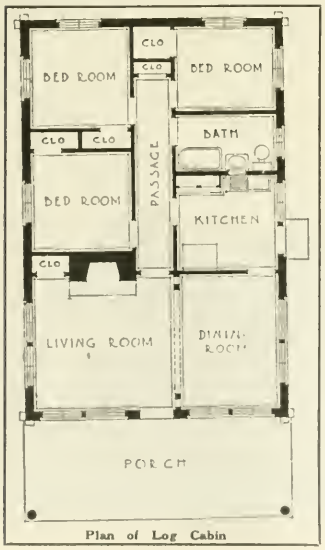
timber as can be had and it should be long enough in the one length to go either the width or the length of the building. If the ground is rather low and the bungalow is to be set high, that is, over 3 or 4 feet, it is necessary that the posts supporting the sill should be braced diagonally by 2 x 4. This method throws the weight of the entire building over a bigger area of ground, which, if it is not done would cause some posts to sink directly into the marsh. This has frequently happened where no mud sills have been used.

If the bungalow is set on posts, a necessary effect to obtain for appearance sake is to tie the building to the ground, as it looks rather awkward to see a house stuck up in the air on a few stilts. The most common way to do this is to put lattice work all around the building, or, what is in most cases preferable, is to tie the building to the ground by means of shrubbery, that is, plant all around the house. This adds the touch of nature that is necessary to complete a bungalow.

On top of the posts or foundation the sill is placed. This consists usually of a 4 x 6 timber running the entire length of the building. Also one of the same size down the middle to serve as a girder. These should be in a continuous length, or if it is necessary to join them it should be done by a half joint.



"WE WON"
To Give the Boys Healthy Outdoor Exercise Is Another Reason Why Parents Will Invest In a Summer Home



Plan of Log Cabin

On top of the sills and girders the 2 x 6" or 2 x 8" joists are placed, and over this the floor, the floor to extend out to the end of the joist. On top of the floor all around a 2 x 4 piece is laid as a sill for the studs. These studs continue to the full height of the ceiling required, usually about 8 foot, and on the top of this is placed a 4 x 4, or as is usually done, two 2 x 4. This serves as a plate on which the rafters rest. The rafters are placed 2 feet on center. The ridge at the junction of the two sets of rafters finishes the framing of the building. The outside of these vertical studs are covered with some form of sheating, depending upon what the owner desires. The material mostly used is called novelty siding. This is simply nailed to the studs. There are other different ways of fixing the outside and this will depend entirely on individual taste. If a shingled outside is desired the studs may be

A Log Cabin for the Woods Is the Ideal Summer Home



C. E. Schermerhorn Architect



Stucco and Bevel Siding in Combination



Designs by Minter Homes Co.

Bevel Siding Used to Advantage

covered with rough sheathing boards or with shingle lath just about 6" on center. If a stucco exterior is desired the building may be rough sheathed, the same as for shingling, then covered with a tar paper and metal lath attached, and the stucco applied to that, or perhaps Bishopric board can be applied or Bykirt lath and stucco applied to that. The latter two methods give an interior wall surface that needs no further treatment and is a cheaper form to put up for a stucco exterior.

In using novelty siding all the interior studs, etc., are all to be of dressed timbers. The idea of this is that the whole interior of the bungalow is of exposed wood which can be stained some color to suit the owner. This makes a very neat appearance from the inside and is the one mostly adopted.

Log cabins, etc., all come under the head of summer bungalows. Of course, a good deal of taste can be displayed in their erection. Perhaps the simplest method is to use slabs as sheathing so as to give a regular log effect and still preserve a smooth interior. This is by far the cheaper way of producing a log cabin effect.

In regard to the roof the rafters in most cases should be sheathed with ⅞" boards as this gives a neat finish from the inside. This should always be done where the room is to be left open. Over this sheathing board any roofing that the owner desires is placed. A rubber composition or canvas roofing can be placed over same and going up a little in expense is the chip slate roofing which is now being largely used in roll or shingle form.

In shingles there are quite a number of different varieties, there is composition, ordinary wood shingles, metal shingles, not to mention asbestos, slate or tile which are in most cases too heavy for the summer bungalow.

If shingles are to be used for covering the roof they may be placed on 1 x 2 inch shingle lath but this will not look as well from the inside if that is to be left all open to the rafters, it is far better to use the sheathing board which should be laid smooth side down.

Sheets of asbestos can also be used as sheathing; simply nail them to the studs and cover the cracks with thin strips of asbestos or wood lath or if an English half timbered effect is desired cover it with vertical strips.

In regard to the floor; a single floor is all that is required for the summer but if the house is to be used in cold weather we advise a double floor with tar paper between. One important thing about a camp is to be sure to have a good dry floor; a double floor gives it.

Bulk headed porches seem to be mostly in favor as they are more easily screened and serve better as outdoor sleeping rooms. One important point in the summer bungalow is plenty of windows. Quite often these are casement so that the full opening can be had in order to get a maximum amount of fresh air.



Picture to Your Prospective Customer the Joys of Having a Home in the Woods by the Side of the Lake—Fishing, Rowing, Swimming, Hunting

These summer bungalows are seldom erected where there is a sewerage system. Therefore, a cesspool is a necessity if water closet and bathroom are to be installed in the house. If one wishes to forego this expense a chemical closet can be installed and a small dry well used to take care of the waste from the kitchen sink.

The water supply is rather an important item. Where there is running water, of course, there is no trouble but if a shallow well has to be driven particular pains should be taken in the location of the cesspool to avoid contamination.

The exterior of the bungalow may be painted with some pleasing colors and can be made very attractive if a little judgment is used in the design. There is absolutely no need to have the neighborhood disgraced with a miserable-looking shack. It does not cost any more to get a well proportioned building that will be an ornament to the landscape instead of a blot. A neat fence with entrance gate and arbor, etc., adds to the attractiveness of the place.

Builders would do well to have ideas to offer the owners of summer homes. It is seldom that they go to an architect for a plan of such structure and it is up to the builder to supply it. It is good business to build an attractive bungalow of this sort because prospective residents will see some bungalow that they like and they usually ask the name of the builder. It is a case of one job being the recommendation for another. Many a carpenter has started in the contracting business by putting up these small summer homes and by giving satisfaction has built up quite a lucrative business of this specialty.



A Wood Church, English in Character

Designed by RALPH E. MILMAN, Architect

MANY churches unfortunately lack good artistic design, but on the other hand it may truly be said that the majority of churches are noted architectural features of their locality.

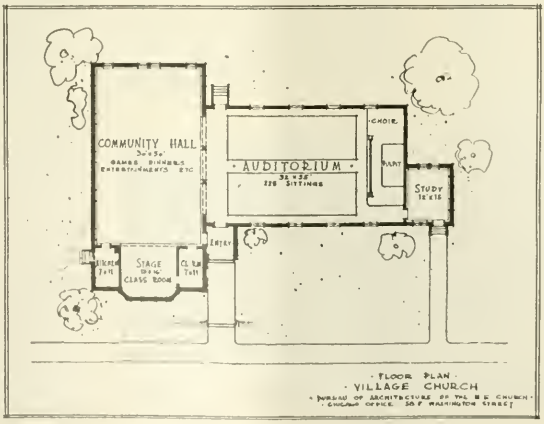
Here is a very interesting sketch and plan of a combined church and community hall. The church proper is a structure 32′ x 55′ in size, affording seats for about 225 worshippers. Additional seating capacity can be had by opening the folding doors leading to the community hall.

This community hall is equipped with a small stage, which, when not serving this purpose, can be used as a Sunday School class room. Adjoining it is a smaller room which serves as a cloak room. Opposite is a kitchen for the serving of refreshments at the various meetings, entertainments, etc.

At the right end of the building is the pastor's study, a room 12 x 15 feet in size; this has its own separate entrance from the street. The exterior arrangement of this study is rather unique, it is added to one end of the church and forms a very interesting architectural feature of this part of the building.

For community meetings, access to the community hall is had direct from the entry, without going through the church proper. This is a design of a village church recommended by the Methodist Episcopal Church Bureau of Architecture. It is a design which was planned for a clapboard or shingle exterior, although it would look equally as well in stucco, either on frame or hollow tile or even of masonry construction.

The large English bay window is an outstanding feature of the community hall end, the slope of its roof is in line with the slope of the main roof. A minaret or small steeple adds to the attractiveness of the design.



Standardization in the Building Industry

By JOHN M. GRIES,
Chief, Division of Building and Housing, U. S. Dept. of Commerce

THE building industry has passed through the youthful stage in which it wanted to try something new every day. With the development of various lines of industry, it was most natural that the experiments would be numerous and the variety of products almost endless. This period in the construction industry has largely passed. There was a time when the producer of materials wanted to make something different from that made by his competitor; to make something distinctive, and he attempted to supply the needs of all customers regardless of the difficulties in producing the article.

Style Goods Versus Staples

A little later the construction industry seemed to have followed in the footsteps of the producers of style goods. Later, however, the builder found that his line of merchandise could be called a staple in a large degree and not style goods.

Better Understanding Among Groups

As long as the building industry did not recognize its component parts, as long as each group attempted to go its own sweet way, as long as the architect, engineer, contractor, building material producer and building material dealer failed to recognize that he was only a part of a larger industry—the construction industry—a semi-chaotic condition existed, but now when they have begun to see more clearly that they all have many interests in common, that conditions favoring active construction favor all, and that a sound construction industry is of the highest public interest, the situation is improving.

Lack of Standardization

It is often said that there is little standardization in the building industry. By this some refer to the design of the buildings, others to the parts out of which the building is constructed, and others to building practice. It is not strange that there are many points of view, for the materials used are numerous and the product differs widely.

The product may be a one-room house, or a forty-room house; a one-family house or a one hundred-family apartment; a business building or a factory. This may be true, but there are thousands of each of these types.

Much of the material in a house is not visible and need not be considered insofar as beauty is concerned. That there should be different designs for houses, all will admit, but this does not mean that no two houses should use the same dimensions or the same materials.

Types of Buildings Considered

While buildings include many kinds of structures, I shall confine my remarks to residential, business and industrial buildings. Here the product is not standardized, and I may say that there never should be a single type for each group. We probably never will have as few designs or models of houses as we now have of automobiles. While we may have houses of a thousand different designs built of a thousand different materials or parts, of different quality or dimensions, standards are found everywhere.

Tendency to Eliminate Varieties

Much has been accomplished. That there is great room for simplification and more standardization is evident to all of those who have started to simplify or eliminate varieties of construction materials. The progress that has been made is most remarkable in some lines, and in every line of building materials some steps have been taken to reduce the number of sizes of the finished products.

Standardization of Materials

Standards of quality are often questions of physics or chemistry which may require long investigation, but certain problems of dimensional standardization promise early results and need not interfere with the necessary variation in design or style. There are entirely too many different sizes and grades of many of our materials. The tendency is towards fewer but the progress is slow. Considering various building materials, we find that lumber cannot be standardized as can steel. First, we have many different species of trees. Many are well adapted for the same purpose and they must compete with each other. They give room for a difference in texture, color, grain, as well as strength. We do not care whether they be soft woods or hard woods, pine, hemlock, or fir; oak, maple, or gum. Still all the species are used in building, and in certain directions there is little chance for standardization. There is, and there should be, greater standardization of sizes and grades.

Some people do not seem to understand the lumber business. They talk as if we had the knotless pine something like the seedless raisin or orange. They seem to feel that you can cut lumber into any shape or size as you can roll steel. There is a limit to the standardization that can well be effected in lumber. Trees do not grow so that you can get a certain number of logs of a single length out of each tree. There necessarily will be different lengths and different grades, dependent largely upon defects. Much standardization has been effected in the past and there is room for more, but the layman's idea of standardization in this field is, as a rule, very crude.

Cut Stone

Cut stone, for example, may vary in size. While the number of sizes may well be reduced, there should not be a single size. A product like stone, which is expensive to work on the job, should be standardized as much as possible and cut at the quarry. If the sizes could be arranged in simple series and rooms or buildings designed with reference to these sizes, there could be a great saving of work on the job. It is often said that products such as stone, brick and tile should be standardized first, since they are most difficult to work to size after they leave the plant

Sizes of Brick

Some say that we cannot reduce the number of sizes of parts. Look at common brick. Here we have few sizes. Although there is much difference in quality, the sizes are few and dimensional standardization has been advantageous. While standardization of face brick can never be carried so far as in common brick,

the present efforts of the industry towards elimination of odd sizes should be encouraged.

Window Sash

The number of styles and sizes of window sash now used is very large. Comparatively few styles or sizes are needed in the building of small houses. The wholesale sash and door dealer often advertises more than 400 different styles and sizes. It would probably accrue to the advantage of the producer, the vendor, the builder and the public if there were a much wider use of a relatively small number of sizes.

Window Glass

If there any need for 100 or 150 sizes of single strength window glass, and approximately the same number of sizes of double strength glass? Are all of these sizes necessary to satisfy the artistic sense of our people? They are not.

Structural Slate

It has been the custom in the structural slate industry for the quarryman to prepare the structural slate in accordance with the orders he receives. The architect and builder specify the sizes. Here we have another instance of production to order which does not permit the quarryman to produce for stock, for neither the size nor the design is known in advance.

Time for Elimination

It is possible that a smaller number of sizes of pipes, drain tile, hollow building tile, glazed tile, the fittings, doors, locks, and other items of hardware, be produced. Just how far it is advisable or advantageous to go in the direction of the elimination of variety, I am unable to say, and I believe few manufacturers or builders are now in a position to answer the question.

Standards of Work

One of the serious problems of builders is that of estimating the amount of labor required to do a given piece of work. Knowing the cost per unit of material it is easy to compute the building cost from the bill of materials, but it is not so easy to compute the probable labor cost from a knowledge of the wage scale. How can a builder figure on the cost of construction without knowing what the labor cost will be? While some of you have done construction work of a certain kind for years from which you have evolved a more or less crude experience table, a rough standard, you are not in a position to estimate the labor cost easily on a new kind of work. You are often compelled to do some guessing.

How many hours will it take, or should it take, to lay 100 square feet of flooring? If the flooring is 2¼" wide, the cost will be different from what it will be if the flooring is 3¼" wide. The cost will differ somewhat if, in one case it is laid on a sub-floor and if in another case it is nailed to the joists. How long should it take to lay 100 square feet of flooring in a six-room bungalow? An office building? An apartment house? Will it take on hour? One and one-half hours? Two hours? or how long will it take the average workman to lay 100 square feet of flooring of a specified size or kind in a specified type of building? This merely illustrates the problem. What is the experience of the best builders? You may know your own records but how do you know that your gauge is all that can be expected?

Laying of Brick

There are few accepted standards of work. Occasionally a builder says that the average bricklayer should lay one thousand or fifteen hundred bricks per day, but what does he mean? One man is talking about summer, another about winter. One is talking about the laying of common brick in a small house, and another is talking about laying brick in an office building.

Some contractors have made time studies and know approximately the number of brick a good workman should lay in eight hours for different types of wall and under different conditions, but the great majority operate on guesses only.

Standards of work should be determined for many different operations. We should know more about the laying of hollow tile, the work of the tile setter, the time required for performing certain units in framing, roofing and siding.

We can not establish standards for work as long as the builder fails to schedule his work. One of the first essentials is to have materials on hand. If the management fails to order the work properly, if it makes the carpenter wait for the framing, if it makes him walk 100 feet to get the studding, you can neither expect results nor establish standards in which both an employer and employee will have confidence.

A Common Language

With the closer cooperation of every element in the construction industry, we will soon speak the same language. We must accept a common terminology. Furthermore, cost accounting must be more uniform than it is today. What two producers, what two vendors, or what two contractors have the same definitions for ledger accounts? Many will say that all agree. You think the other fellow uses your terms and he in turn thinks that you use his. I have examined many sets of books and found that even among those who claim to have the same system that the definitions of accounts differ.

Cost Accounting

When contractors compare costs with each other, I become skeptical. Why? Because I have often found that the definitions of labor accounts vary widely, that contractors are talking about entirely different things. The account may bear the same name but the expenditures charged to the account are not the same. I have seen trucks charged to a single job or to the month's expenses, while others have charged it to equipment.

Forms of Contract

Why should not contract forms be more nearly standardized? If good contract forms are adopted much less time need be devoted to the study of the contracts. Litigation will be less common. There will be less misunderstanding and a better spirit exist.

All Are Interested in Simplification

To reduce the number of varieties is one way of eliminating waste, of producing at lower cost and increasing the amount of building and home ownership. And the owner of the building when completed will find it much less economical not to be able to buy standard stocks in maintaining the structure.

The construction industry is making great progress. One of the greatest advancements made recently is the recognition of the fact that it is one of the great industries and that the individual parts or groups realize that they are a part of that industry and that cooperation is necessary to insure progress and obtain the benefits of economies made possible only through cooperation.

Unusual Home Design

Good Plan and Attractive Exterior for Small House on Narrow Lot
Entrance Made a Distinctive Feature

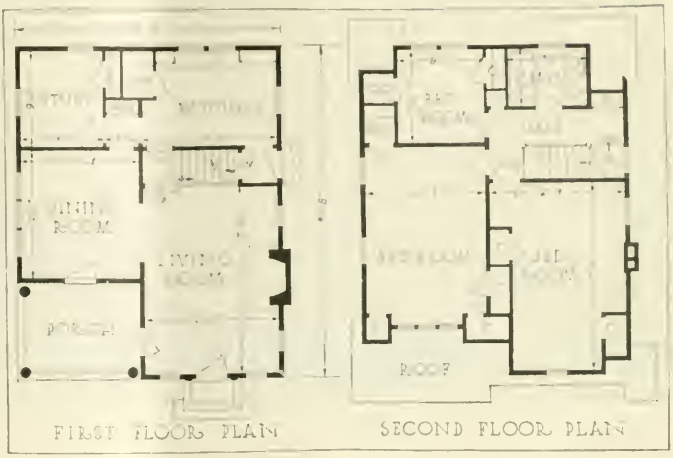
GEORGE O. BARNES, Architect

THIS attractive small house shows a variation of the Dutch colonial style of building that is well suited to a narrow lot. The frontage of the house is 25 ft. 6 ins. and it has a depth of 32 ft., which provides for a good arrangement of rooms.

Space is saved by the elimination of the hall, the entrance being directly into the living room, with an attractive open staircase forming the feature of the end of the room.

The kitchen shows a good arrangement of cupboards either side of the sink and a china closet in the passage to the dining room.

The additional room on the first floor might be used as a study, or it would serve equally well the purposes of a maid's bedroom, because of its nearness to the kitchen.





The Exterior Design Is a Pleasing Combination of Different Styles of Architecture

Building a House in Five Days



Monday



Tuesday

BUILDING a complete six-room house in five days is quite a feat in construction work and many people would think it an impossible task. Still this really had to be done at the recent Own-Your-Home Exposition held in New York.

The work of arranging the exposition started Monday morning, May 17th and the show opened at 3 P. M., Saturday with the house completed, decorated and furnished.

We present herewith a very interesting pictorial history of the erection of this house which was called "The Beautiful Home Convenient." A perspective view of this home, prepared by the architect, together with the floor plans were illustrated in our April issue and it will be interesting for our readers to turn back to that description for comparison with the present pictures.

The house as pictured here was erected complete in every respect with the exception of foundation and sewer pipe connections. The exposition was held in the 69th Regiment Armory and to protect the wood drill floor it had a covering of roll rubber roofing.

Our first picture was taken Monday at 5 P. M. and shows the progress made that day. It will be noted that the frame work of the house was made in sections in the shop and assembled at the exposition hall. Even the rough flooring, the sheathing and roof sheathing were also in sections; the idea being to cut down, as much as possible, all cutting on the job.

Tuesday was spent in completing the frame and putting the sheathing in place, this picture clearly shows how the sheathing sections were made.

Wednesday the windows, complete with sash and the outside trim, were put in place while Thursday saw the building completely covered with metal lath and by night the rough coat of stucco was applied.

Friday morning the cement tile roof was commenced, the finished



Friday Morning

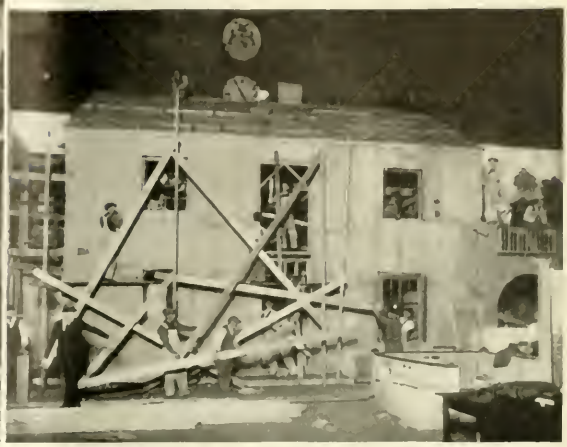


Friday Night

Rapid Construction for Exposition



Wednesday



Thursday

trim for the front entrance door with the ornamental window and balcony above were all set in place and the finished coat of stucco started.

While the outside work was going on the inside was being wired for electricity both for lights and appliance outlets. Wall board was applied to the studs and joists, the stairway installed, the floors covered with a special rubber tiling, plumbing fixtures set in place, etc.

Saturday morning the house was cleaned out and the outside scaffolding removed, and rubbish cleaned away, and the finishing touches applied to the exterior trim.

Then the house was given over to the furnishers who placed the furniture, hung the draperies, pictures, etc., in fact made it a home. At 3 P. M. it was ready and opened to the inspection of the public.

The construction work was carried on under the direction of the architect, Dwight James Baum. The erection was the work of the Lewis Lumber & Supply Co., of New York, and too much credit cannot be given them for doing a really creditable piece of work in a very short time. It seems a pity that such a complete little home was not up for keeps but it served its purpose by being a very interesting feature in an interesting and successful exposition of home building.

The same principle of construction that made for the rapid erection of this building could be applied to regular field construction. Framing can all be cut and fitted together at the shop and spiked in place just as was done in the erection of this building and it may mean a big saving.



Saturday Afternoon, the Dining Alcove, Hall, and Living Room Papered, Painted and Furnished, Ready for the Visitors

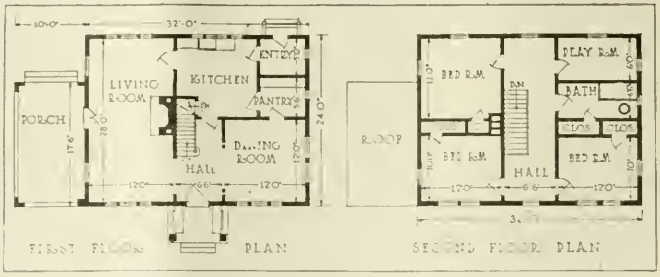
Shop Framed Houses

How to Save Labor and Material by Fabricating and Assembling the Framing Sections at the Mill

By A. H. SCOTT

THE idea of the ready-cut or ready-framed house is nothing new, but under the limitations and handicaps with which builders have had to work during the past few years the production of such houses has been given an impetus which has produced many economies. Close attention has been given to cutting down every possible item which would affect cost of production, and equally close study has been made to reduce the amount of labor which must necessarily be performed when the parts for such a house reach the site where the house is to be erected.

The results of all this study and effort are of interest to builders and contractors everywhere, for under pressure of the shortage of houses and the high cost of building it well behooves the builder to keep thoroughly abreast of the constantly improving methods by which ready-framed or ready-cut houses are produced and erected.



"Homes, Not Houses," is the slogan of Mrs. Kate E. Wilder, the originator of Wilder's Ready-Framed Houses, and anyone who has inspected one of the buildings erected by this woman architect and builder will readily agree that it is all that the term applies. Mrs. Wilder got her idea of brace framing in sections from our New England forefathers, whose method was to frame the structure in sections flat upon the ground, and when all was ready to call the countryside to the "house-raising." From 30 to 50 husky men usually attended these affairs and it was quite usual, with the aid of a convenient cask of cider, to not only raise and roof over the house, but to completely sheath it in one day.

Mrs. Wilder's method of fabricating and assembling the framing sections at the mill is a distinct advance over the original method and over





The Fabricated Frames Ready to Be Raised

that of the so-called ready-cut house, in which much time is lost in sorting over the various parts. The lumber, North Carolina pine, is first dressed on all four sides and then cut according to drawing, in sets of five, as this is the minimum number of any design which it has been found economical to fabricate at any one time.

To prepare material for five houses requires only 70 working hours at the mill, all the sawing for five duplicate houses being done by one man, who has to make but one reference to the drawings for each set of five of any one part. These parts are piled in sets of five and move forward to the assemblers, who nail the framing materials together and number the sections thus formed. The diagonal bracing is all cut from material which would ordinarily go to waste if the lumber were hand-sawed on the premises.

To take a specific instance, many piazzas are 7 feet wide—an odd width, which results in much waste of material. Mrs. Wilder makes her piazzas 8 feet wide and uses the 4 feet left over from 12 foot studding to make two 2-foot braces. This diagonal bracing, which is also used between studding in partitions, holds every stud firmly in place, resulting in a wall that will not crack and a house that cannot sag.

The sections are made to fit perfectly, being just the proper sizes to load well on a flat car, one car usually being sufficient to carry the framing and other rough material for a house.

All sills are tarred and bolted to the foundations, the floor joists being set on 16-inch centers and well spiked to the sill and upright stud. A solid line of bridging is set, and all rough flooring laid diagonally.

The old style lock corner and brace is used and makes the building so firm and rigid that old Dame Nature is unable to rack it. These braces also safeguard the plaster from cracking, for when a house is balloon-framed straight up and down and when the inevitable shrinkage comes, something has got to give—the lath pulls from the studding and cracks the plastering.

The accompanying illustrations show various stages in the erection of one of these houses, the actual time of raising all four sides of the first story being 38 minutes, and it was only necessary to remove ⅛ inch from the lower end of one section to make a perfect fit—eloquent testimony to the accuracy of the work.

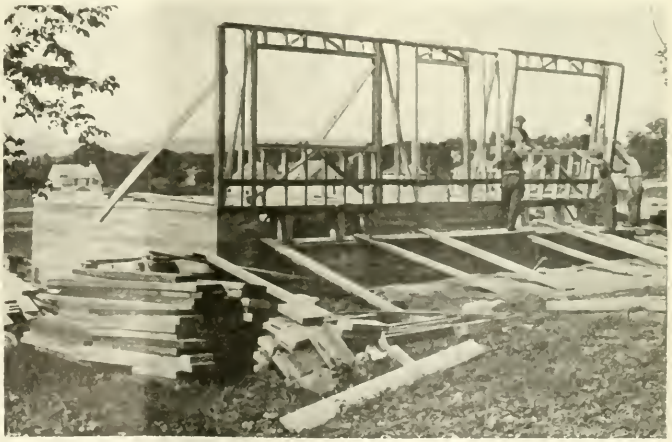
The same exceptional care is used "from the ground up" in Wilder's houses; an 18-inch footing of 3 to 1 concrete mixture is provided to insure an absolutely firm foundation and to eliminate any possibility of the setting of cellar walls and the consequent sagging of the whole structure.

Lumbering is never graded below what is standard practice. Girders are 6 x 8 long leaf yellow pine; joists first and second tiers 2 x 8 on 16-inch centers, third tier 2 x 6 on 16-inch centers; roof rafters 2 x 6 on 24-inch centers, and 2 x 4 studding. Sills are 6 x 8, tar coated on all sides and imbedded in a rich concrete mixture. Half-inch bolts are set in the foundation every 6 feet, anchoring the sills and the whole structure firmly to it.

The cellar windows are all set in concrete and well packed with 3-ply building paper on all four sides.

If there is an overhung bay window or bedroom which extends out over the line of underpinning or piazza, unusual precautions are taken to prevent the entrance of draughts, the bedroom floors being protected with 3-ply waterproof paper over which is laid wire lath, followed by a scratch coat of cement.

This effectively prevents the entrance of wind and also allows for any shrinkage. The deck under the bay window is protected with canvas decking, properly shrunk with salt water and filled with white lead, followed by several coats of oil. As a further precaution, this space is filled in with broken tile over which cement is poured.



Raising the Different Framed Sections

Apartments for 1,600 Families

The Mammoth Building Project of the Metropolitan Life Insurance Company $100,000,000, to Be Invested in the City of New York

ON April 14, the Governor of New York signed the bill which enables the Metropolitan Life Insurance Co. to invest some of its funds in housing construction. Previous to this as described in the last few issues of the BUILDING AGE and THE BUILDERS' JOURNAL, this insurance company was able to help building along by advancing large sums to different loaning companies who acted as their agents. No loans were made direct.

In approving the Metropolitan bill the Governor said that it was a temporary measure only, to relieve an emergency, and could be justified only as such. The Governor reiterated today previous statements that he had serious doubts about the wisdom of the bill, but said he yielded to the belief that there was little danger of any harm from the measure and much hope of real relief. In a memorandum he said:

"This is a temporary measure to relieve an emergency, and can be justified only as such. The duration of the powers granted is limited to March 1, 1924, the date to which the rent laws have been extended, or to the duration of the present housing emergency, which must be construed to mean until March 1, 1924, unless the Legislature shall further extend the emergency laws.

"At least one company proposes to take advantage of the act, and has already prepared plans which it is prepared to put into immediate execution. It proposes to erect sanitary, well ventilated tenements to rent for $9 per month per room or less. Its estimates, based on actual market conditions and labor costs, without taking into account possible concessions, indicate that at a less rental than that prescribed by the act, the investment will yield a 6 per cent return after allowing for depreciation and a sufficient amortization during the tax exempt period to offset a possible decline in prices.

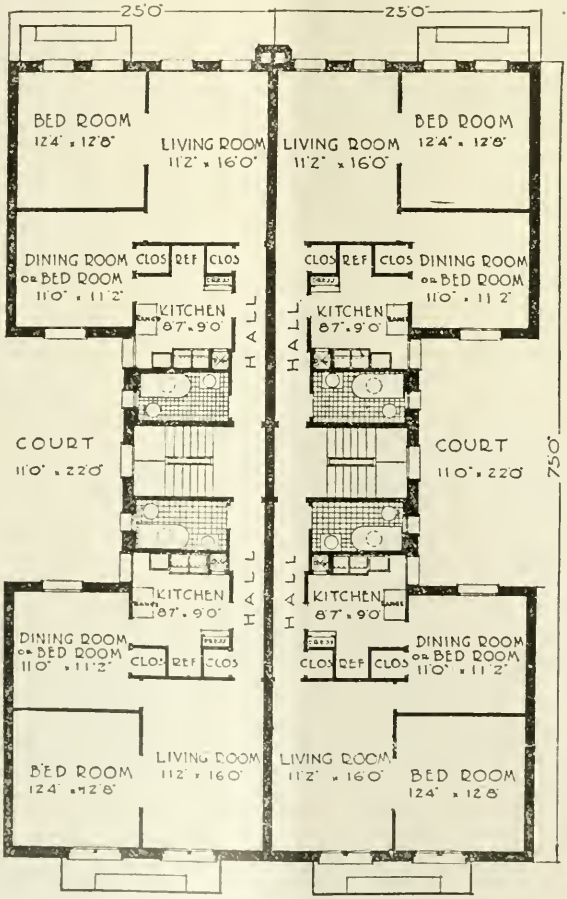
"Proper housing so vitally affects the health of the community as to be a matter of pecuniary interest to insurance companies."

Type of Houses Selected

The building program of the Metropolitan Life Insurance Company will be started immediately with the erection of fifty houses, accommodating thirty-two families each, in Long Island City and Astoria. Walter H. Stabler, Controller of the Metropolitan, said tentative plans for the apartment houses have already been drawn, and the company is ready to buy sites after selections have been made from a number of pieces of property offered.

Andrew J. Thomas, who has been engaged by the Metropolitan as architect for the new apartments, has commenced work on the detailed plans. C. Everett Waid, architect for the company, will cooperate with him. Mr. Stabler said that the architects' forces would work night and day to rush the plans to completion and that he expected that they would be ready within ten days or two weeks. We show a floor plan of an apartment project recently designed by Mr. Thomas.

The type of house that has been chosen is a four-story structure with three, four and five room apartments with baths. All the houses are to be steam heated and will be without interior courts. "Mr. Thomas's plan is an excellent one," said Mr. Stabler. "Everything is very simple.



Typical Floor Plan of the 68 Apartment Houses to Be Erected in Norwood Gardens, Long Island City, by Bernard M. Maltz

There are no fancy fixtures, but the houses will be good, wholesome places for people to live. All of them will be comfortable and well ventilated."

The houses will be erected in blocks, and it is expected that four whole blocks will be required for sites for the first fifty structures. Mr. Stabler said that all of the sites under consideration were close to good rapid transit facilities.

Taking Mr. Stabler's figures for the cost of the first fifty buildings in relation to the number of tenants they will accommodate, homes for 128,000 persons would be provided if the entire proposed $100,000,000 building program of the Metropolitan Company is carried out. The first step in the program, calling for the fifty houses, would provide homes for 1,600 families.

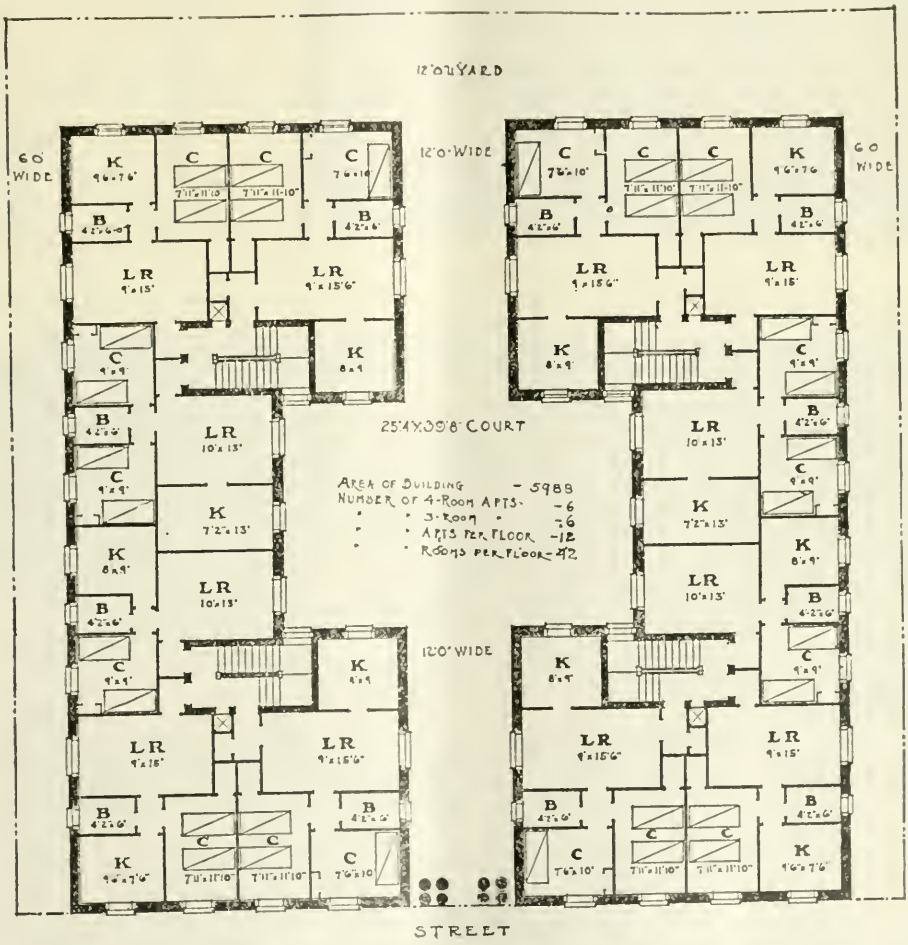
About six weeks ago, the Metropolitan Life Insurance approved loans amounting to $2,750,000 to build sixty-eight, six-family apartment houses, forty-eight two-family houses and 250 one-family houses in the Norwood Gardens and Arleigh sections of Long Island City, at a cost of more than $5,000,000, including the land.

These buildings, which will provide accommodations for approximately 800 families, or about 4,000 people.

Bernard M. Maltz, one of the largest builders in Brooklyn, will build sixty-eight six-family apartment houses, each 25 by 75 feet, on plots 25 by 100 feet.

Each building as shown on the floor plan shown here, will contain six four-room apartments.

The buildings will be thoroughly first class in construction in every respect, the fronts being of the best quality tapestry brick, with stone trim.



House With Open Court, Designed by Andrew J. Thomas. Plan Drawn to Prove That a Better and More Profitable Building Can Be Erected on 55 to 60 Per Cent. of a Lot Than on a Larger Percentage.

Automobile Sales Building

Located at Flint, Mich.

Designed by DAVIS, McGRATH & KIESSLING, Architects







Window Glass and Its Glazing

By A. ASHMUN KELLY

TWO things are essential to a perfect job of sash glazing, properly primed sash and good putty. The sash that comes from the factory ready glazed is apt to part with its alleged putty sooner or later. Such sash is dipped in a thin mixture of rosin oil, to which putty will not adhere. The putty used is apt to be made from pulverized limestone and mineral or resin oil. Such putty will not stand up very long against the elements. For a good job it is better to have the glazing done on the premises, where it will have the proper attention.

The best primer for the sash is raw linseed oil with a little white lead and a very small quantity of driers. The essential ingredient is the oil. It must be pure raw linseed oil. If the sashes are to be finished au natural, then prime with the oil only, with a little japan drier. If the inside is to be finished natural and the outside painted, then prime the whole sash with clear oil only.

The purpose of the oil primer is, of course, to keep the wood from robbing the putty of its oil, which would weaken it. The white lead simply aids the oil in closing the pores of the wood. The factory plan is to use whiting in place of white lead in the priming, and that is not so good.

Directions for glazing need not be given, for the painter will attend to that. But here is a little wrinkle that all expert painters do not know; when done glazing a sash take the duster and dip it in clear cold water, and brush the glass off around the glazed parts, which will remove the grease. If this oily grease is left to dry on the glass it is almost as difficult to remove as paint.

It is always best to bed sash, though it is not usually done on small lights. This, because it very seldom occurs that glass is perfectly level on its flat side, hence does not lie flat against the wood. But to bed glass

Nothing looks much worse than the putty showing from the inside, against the glass; to prevent it don't let the putty come quite to the edge of the muntin, as seen below the glazing. So also, when tracing the sash, don't let the paint get beyond the muntin. Expert painters know what to do, but they sometimes require watching, to keep them right.

In fastening down the glass do not get the latter too tight against the wood, but allow for expansion, for glass sometimes breaks because sprigged too tight. The bevel side of the glass is placed to the outside, the flat side to the wood. Never cut the wood to make a glass fit, but rather cut the glass. If the light is short, fasten it at the top so that it cannot slide when being handled.

For quick jobs of sash priming and glazing, use raw linseed oil with plenty of driers and no white lead, or use boiled oil alone.

To bed small lights quickly, roll out some putty on a level board with a rolling pin, to any desired thickness, this depending upon size or thickness of glass, and take up the putty by pressing the edge of the glass against it.

To remove putty marks from ground glass, or glass with any sort of rough surface, to which the putty will stick, use a solution of lye, with a small swab. Some rub soap along the glass before glazing.

The question has been asked, should the sash in a front door be placed with putty inside or out? The carpenter seems to be the arbiter in this matter, but as a general thing such sashes look better with the putty showing outside, but there are some exceptions. The writer thinks, as a mere painter, that the sash and door will look better with the putty showing from the inside.

Plate Glass

USUALLY the specification for plate glass is for American glazing-quality, and if a better grade is desired then select the "silvering" quality. Or for the very best specify the "French silvering" quality. This is as fine a glass as probably can be made. It is nearly silver-white, whereas, the American shows a slightly greenish tinge. While the usual thickness of this glass is about one-fourth of an inch, yet it may be procured in any size or thickness for special purposes.

The only defects apt to be found in plate glass are bubbles, with an occasional gray spot, where the polishing has not been perfect.

There is a double-thick first quality American sheet glass that may be used in place of plate in many cases. It is a clear glass, with good weight and sufficient thickness for usual plate glass purposes. It is, of course, cheaper in price than regular plate glass.

The thickness of plate glass runs according to the size that it is necessary to use, and this according to the wind-stress, for which I have no figures at hand, and it is the architect's matter anyhow, and he has figures showing the facts in the case.

Even plate glass has considerable flexibility, and in large panes is strong enough to withstand great wind pressure, but that is not the only test that it must ordinarily undergo. One of the agencies it must be guarded against is the power of the sun, which expands and contracts it when subject to its full power. It is for this reason that it is not advisable to paint or letter too extensively on a plate glass window, owing to the unequal expansion and contraction of paint and glass. Many cases of broken plate glass windows have been reported from this peculiar cause.

Sheet Glass

AMERICAN single-thick window glass averages about 1/10 inch in thickness, and weighs about 18½ ounces per square foot. It is safe to use against ordinary wind pressure in sizes up to 30 x 40 inches. Double-thick glass, which is about 1/7 inch thick, requiring a counter-balance of 24½ ounces to the square foot, may be had in sizes up to such as will make the total sum 320 inches. That is to say, 60x60 inches, 40x80 inches, or anything within these limits. While double-strength glass may be used in place of plate, it is only in stationary lights and in protected situations.

It is hardly safe to use double-thick window glass above 40 x 44 inches in exposed positions or in movable sash.



Modern School

Interesting Design with Assembly Room in Separate Building

Designed by SCHERMERHORN & PHILLIPS, Architects

HERE is an interesting school which was erected at Fort Washington, Pa., for the Upper Dublin township, from plans prepared by Messrs. Schermerhorn & Phillips, architects, Philadelphia. The general contractor was William L. Hampton of Pottstown, Pa.

An old four-room building was remodeled into an auditorium, which was connected to the new building by means of a covered passageway. First two class rooms (Nos. 1 and 2) were erected. At this time a dry closet toilet system was installed of ample capacity for the completed building.

The main stairway is of reinforced concrete construction with side walls of glazed brick. Slop sinks are provided on each floor in a janitor's closet.

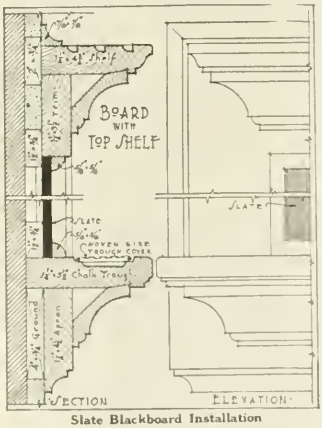
The library on the second floor is also used as a directors' room. The teachers' room over the main stairway contains, besides toilet facilities, a built-in medicine closet and electric heater receptacle which is used in making coffee, etc.

The building is built of local stone and is heated and ventilated by means of a fan furnace system.

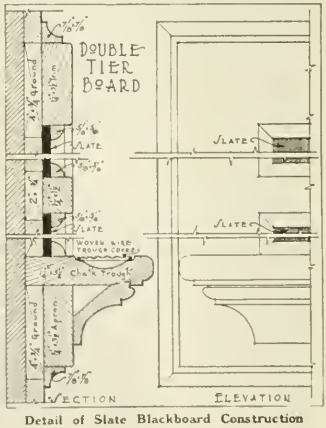
Above the main entrance is the inscription *"Let the Spark of Learning Glow."* This inscription was selected from many submitted in a competition by the pupils of the school.

The picture on the opposite page shows an interesting view of class room No. 1. The other class rooms are laid out in a similar manner, blackboards are placed along the walls.

In regard to this subject, we give two details of good methods of erecting slate blackboards in school rooms. These details were kindly supplied us by Mr. D. Knickerbacker Boyd, Architect, Philadelphia, who has made a special study of the proper installation of slate for the Structural Service Bureau of the slate producers.



Slate Blackboard Installation

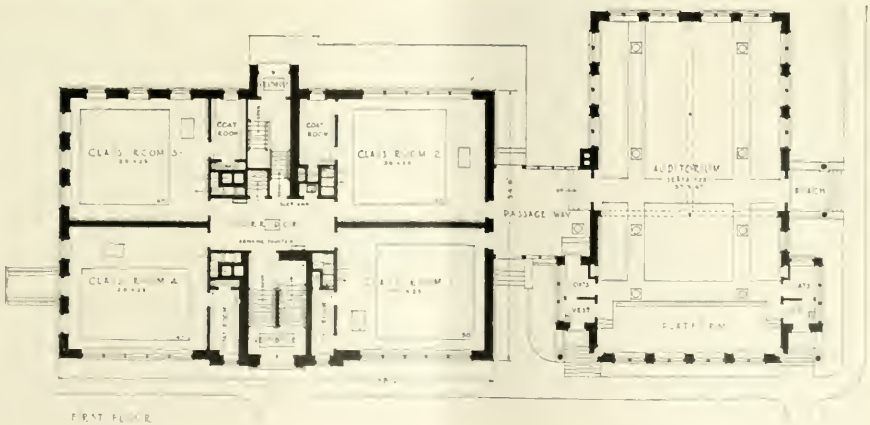


Detail of Slate Blackboard Construction




CELLAR

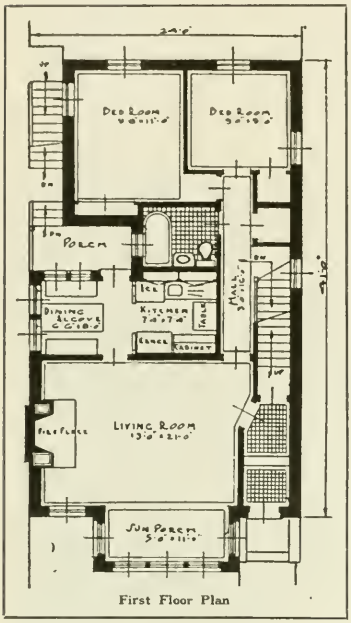



CLASS ROOM 1
COAT ROOM
COAT ROOM
CLASS ROOM 2
CLASS ROOM 3
CLASS ROOM 4
PASSAGE WAY
AUDITORIUM
STAGE
FIRST FLOOR

Two Family House Design

Erected Complete as an Exhibit at the Recent Own Your Home Exposition in Chicago

Plans prepared by HENRY K. HOLSMAN, Architect



First Floor Plan

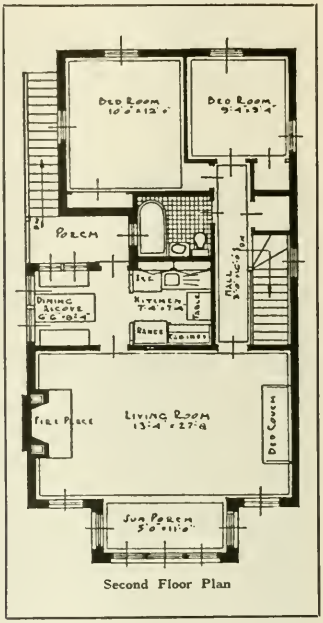
stead of detracting from it as is so often the case in this particular type of a dwelling.

This house really consists of two very convenient five-room bungalows placed one over the other, each having a large living room with attached sun porch, two bedrooms entirely separated from the living rooms with adjacent bathroom, and a most conveniently arranged kitchen with a dining alcove which is exceptionally well lighted.

The kitchen is provided with plenty of storage room in the way of cupboards and closets.

This is an economical type of house to build because one basement, laundry, heating apparatus, one plumbing stack and the one roof serves both homes. It casts less than two separate homes and it makes a better investment, for in a great many cases rent from one home is sufficient to make the payments on the building.

The house was built on the Exposition floor as an object lesson to home builders. It was constructed of frame

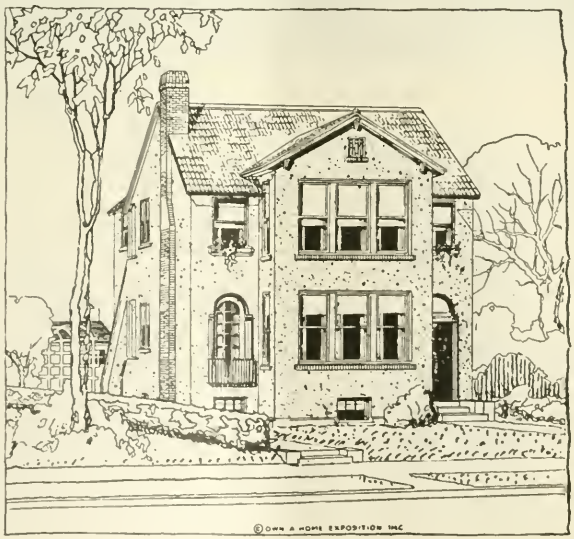


Second Floor Plan

ONE of the interesting features of the recent Chicago Own-Your-Home Exposition was the complete two-family house shown as the principal exhibit.

The plans for this building were prepared by Henry K. Holsman, Architect, of Chicago, and the building was erected and built on the Exposition floor by the Holabird Construction Company also of Chicago.

The house as pictured here has the appearance and good proportions of a one-family dwelling of two stories. It has been so arranged that the back porch and back stairs add to the lines of beauty of the design in-



covered with stucco, with brick trimmings and had an asphalt shingle roof.

The design is somewhat along Spanish lines; a very artistic effect can be had by having the stucco tinted a cream, the brick a dark red, the trim of the windows, etc., a light green, with the balcony rail in black, this with a red Spanish tile roof either in metal or clay.

The plumbing arrangement cuts down the cost of the waste, and vent pipes and the labor of installing is therefore easier. All these little details have been considered so as to have the cost of construction reduced to the minimum.

Training Apprentices

Extracts from a Paper Submitted to the National Conference on Construction

By HUGH FRAYNE, of the A. F. of L.

I DO not believe there is any question as to the need of vocational or industrial training, or that there should be a sound and unified system of promoting it throughout the country.

We have advanced far in this connection and with the new condition that has come as a result of the world war, the need for highly and specially trained workers in industry is more apparent than ever before. This is not only necessary to meet the emergency of reconstruction now but it is a fundamental that applies to the social and economic life of the nation for all time.

It must be started by a group that will be representative, that will set forth a constructive program, and I think now is the time to decide upon organization and to start the work by the employers, the representatives of labor and the boards of education of the country formulating a definite program.

Recognizing the necessity of well trained mechanics in the various branches of the building trades, developed through a properly regulated apprenticeship system such as will give the boy the right kind of training that will make him a competent mechanic, able to give a fair minimum of service at all times, due consideration must be given to the fitness of the apprentice to take up or learn any given trade.

The responsibility of proper training rests upon the employers' associations and the unions, both in the selection and the development of apprentices. The building industry does not need more mechanics as much as it needs better mechanics.

WE believe that technical and industrial education of the workers in trades and industries, being a public necessity, should not be a private but a public function, conducted by the public, the expense involved at public cost and as a part of the public school system. In order to keep such schools in close touch with the trades and industries there should be local advisory boards including representatives of the industries, the employers and organized labor. I believe it is not impossible in many instances for a person to do much more work without extra physical strain through the proper training. There is a right and a wrong way to work. An experienced trained man can work as many hours as necessary without strain and do efficient work, whereas an untrained man, not knowing how, will work harder and accomplish less. This will apply to any worker who has not been properly trained in the handling and use of tools.

There is a right and a wrong way to sit on a chair or at a bench and work; a right and a wrong way to stand at a machine and to adjust it. All of these things have an important bearing upon the question of industrial training.

When properly worked out this systematizing tends to increase efficiency and production without causing extreme physical strain upon the worker. This extra production should always be recognized and the workers should share in it by an increased compensation.

THERE are many so-called trade schools in this country where they attempt to teach young men and women trades and parts of trades, and turn them out after a time, absolutely unfit to take their proper places in any of the trades or callings. They become dangerous competitors of the unions who have worked to establish themselves not only as skilled in their trades but to establish a high standard of living.

THE untrained worker is a liability on industry. The skilled worker is its greatest asset.

Skilled workers and trained mechanics are a nation's income, while the poorly, inefficiently trained workers are its deficit.

In many of the private trade schools employers train young men especially for their own industry and when that young man leaves that employment he is helpless to go out into the world because he is not competent to work as a skilled mechanic and command the wage rates and standards established by the unions.

As to what the American Federation of Labor is doing to promote vocational education, I believe I am safe in saying that its work up to the present is of a sound and constructive nature. We believe that the public schools should teach the theory of the trade while the actual practice and processes should be taught in the shops.

INSTRUCTIONS in a trade should be taught by an experienced, practical journeyman of the trade, with ability to impart knowledge. This method permits of continuous development of capacity and relieves the manufacturer of the expense of theoretical instruction and provides a means of weeding out boys who are not adapted to particular trades.

By this method the boy, the employer and the community are benefited. The obligation to provide industrial education of a theoretical nature, therefore, should rest entirely with the public schools.

It is generally agreed that the boys and girls of the present and future should be properly trained but that training should be of the right kind. The student should understand to not only work the materials but to learn all about the materials.

The hands and brain cannot be too highly developed. The student or apprentice should be developed to fit the trade, not the trade to fit the student. Higher skill developed in the mechanic means higher wages and better conditions, as well as a general benefit to the country.



The First Contract

Homes That Holm Built



Two Brick Houses

Interesting Story of How a Bricklayer's Apprentice Became a Successful Contractor Specializing in Home Building

STARTING in the building trade as a bricklayer's apprentice, and in a few short years becoming one of the leading home builders of Chicago sounds more like a good story in a magazine on success than the real tale of a business career in the building game.

Truth is often said to be stranger than fiction, but the truth about the success of T. A. Holm is not so strange when he tells it himself: Vision, hard work, and satisfying his customers sums it all up in a few words.

Mr. T. A. Holm is the head of T. A. Holm & Co., Builders and Realtors of Chicago, and they have over 500 houses to their credit in about nine years of operation—almost one a week!—a record to be proud of.

T. A. Holm was born in Copenhagen, Denmark, on August 17, 1880. His early education was in the elementary schools, with two years spent in high school.

Coming to this country when a lad, he began work as a bricklayer's helper, and later became a full-fledged bricklayer. He spent his spare time in studying the building business, practising drafting, reading books and magazines, and spending two years in a night course at a technical high school.

He kept on working at his trade, saved his money, observed what people wanted, studied the essential principles of home building, then with an ample fund of experience, and his little capital, he started the year 1908 by commencing work on two small brick houses, pictures of which are shown above.

These first houses contained a layout of rooms and features that he observed were what the people wanted, and he had but little trouble in selling them at a good profit. The next step was to build more and sell these, and he has kept at it for the past fourteen years.

Later, as the business grew, it was necessary to form a mortgage company so as to handle the financial part of their construction business. This is another service for the home builder, and is in line with what we have mentioned quite often in the columns of BUILDING AGE and THE BUILDERS' JOURNAL, that builders, to secure more desirable business, should form some reliable financial connections so that they will be able to offer the prospective home owner a complete service payable on easy terms. Holm will sell the lot, prepare a plan, secure the money, and build the house for a small cash payment with balance same as rent. This sounds good and meets the popular demand.

Of course, to do all this requires considerable attention to many details, and Mr. Holm has been fortunate enough to secure some able lieutenants who see that all the various little matters are attended to so that his customers are pleased and stay pleased. Mr. Holm declares, like Mr. Ford, that a satisfied customer is the best advertisement he could obtain.

Mr. Holm, away back in 1914, obtained a sworn statement from fifty satisfied customers, and he made the most use of this to convince prospective customers of his fair dealing and ability. The testimonial reads as follows:

"We, the undersigned, have purchased homes from T. A. Holm & Company, Oak Park, and have found them to be all that was claimed.

"Our dealings with this firm have been entirely satisfactory and their treatment of us has been all that could be desired.

"We are pleased to have our names added to the list of their other Satisfied Customers."

This was signed with names and addresses of Mr. Holm's customers, also the date when they bought the house, and as some of these dated back several years they had more weight. The plan was to demonstrate to prospective home buyers, through the experience of others, as certified by them, the safety and desirability of doing business with the Holm firm.

> PROPERTY is the fruit of labor; property is desirable; is a positive good in the world. That some should be rich shows that others may become rich, and hence is just encouragement to industry and enterprise. Let not him who is houseless pull down the house of another, but let him work diligently and build one for himself, thus by example assuring that his own shall be safe from violence when built.
>
> —ABRAHAM LINCOLN.

No more effective means of sales making and interest creation could be had, perhaps, than the circulation of the fac-simile signatures and addresses of satisfied buyers, all uniting in friendly aid of the building firm which had helped them in establishing their homes.

"Homes That Holm Built" has become a slogan in the districts where he operates.

One very effective way of securing interest in his advertising literature is by the use of quotation of celebrated men on the question of home ownership. A quotation of Lincoln is reproduced here. This is one of Mr. Holm's favorites.

He has always been a distinctive and progressive advertiser, using the local newspapers, both display and classified space; also by cards in the street cars, and the distribution of booklets and circulars. These are well illustrated with pictures and plans of the houses. He had an interesting display at the Chicago Own Your Home Exposition, a picture of which we show herewith. Mr Holm is seen sitting down toward the right of the booth. Here is a big, successful builder who finds it profitable to advertise.

In scheduling the material and labor for so many building operations it is necessary to keep accurate records. An itemized cost of each building is kept on file. Cost record and accounts are maintained as nearly as possible to a 100% efficiency basis.

Building superintendents visit each job daily to inspect the work and order the necessary materials delivered to same. Delivery is made by their own auto trucks. Material for many buildings are ordered at one time, frequently in carload lots. When these arrive every item is carefully checked over with the bill of lading or delivery tickets.

It is up to the superintendent to see that the proper material is sent to the job, and approximately the right amount is delivered to each job, a list of which is given to the foreman, who places the material on the site in convenient piles and has same delivered to the workmen at the proper time.

On every job it has been found to be a profitable investment to use a concrete mixer operated by a gasoline engine.

Here are the primary reasons why Mr. Holm has developed his big building business until it has attracted signal attention among realty men and investors in home properties:

First, he figured that thousands of Chicago men want single family houses. Second, they must be good houses, honestly built, correctly designed, and properly located. Third, the transportation to and from the city must be good, and the future value of the property protected by desirable restrictions, surroundings and plan of development. Fourth, the houses must be moderately priced. Fifth, the houses must be sold upon an easy payment plan. Sixth, the policy of the building and selling organization must be one of fair, square dealing.



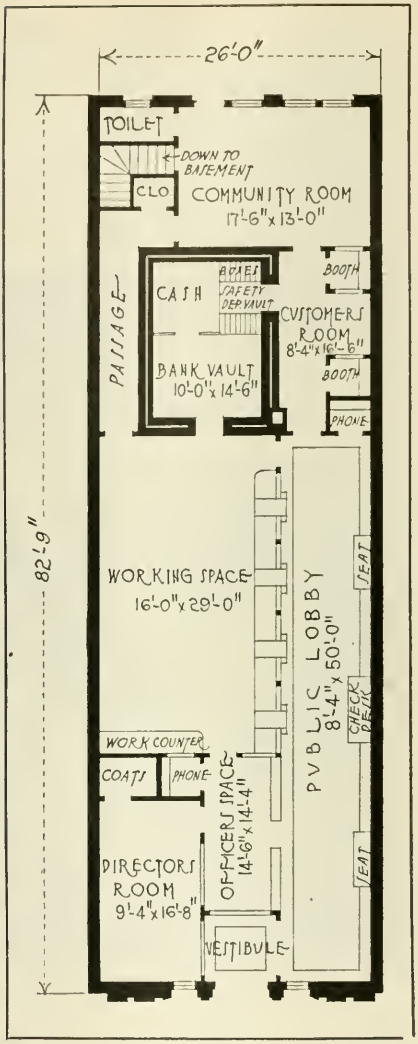
Exhibit of T. A. Holm & Co., at the "Own Your Home" Exposition, Recently Held in Chicago.
Mr. Holm Is Seen Seated at the Right End of the Booth.

Artistic Design *of* Modern Building *for* Bank

Brick and Terra Cotta Combined Produced Dignity and Beauty

The LYTLE CO., Architects





PROPER housing for a banking institution is not only demanded by the business of the bank, but to have a good-looking building is also a direct and valuable asset to the bank itself. People have more confidence and greater pride in dealing with a bank that is housed in an up-to-date bank building of its own.

The building shown here is that of the Brown National Bank of Sioux City, Iowa. It was designed and erected by The Lytle Company of the same city. The base of the exterior is of limestone. This forms the pedestal for the pilaster treatment, the base and caps of the pilasters are of terra cotta, as are all the other ornamental parts. The flat walls and pilaster shaft projections are of dark red tapestry brick. The entire appearance is dignified, yet artistic.

The interior is very well laid out. There is adequate public space, and good working space. There are no side windows, as this bank was built on an interior lot; adequate light is secured from the front windows which are exceptionally high.

The arrangement of the vault in the center is a little different than the plan used in the majority of small bank buildings. It has been so arranged that it is easily accessible from the banking space as well as from the customers' room, so that the safe deposit boxes can be easily reached besides affording customers the necessary privacy. To do this effectively, two small booths have been placed in the customers' room.

What the Editor Thinks

Is There a Building Boom?

THE large amount of building now being done especially along residential lines, is somewhat in the nature of a boom. There is such a thing as having too much business to attend to and it is wise at this time to pause for a short time and consider the possible troubles that may arise.

When there is an active and eager demand for materials, as well as labor, the prices are bound to increase—this is the law of supply and demand. The present excellent state of the building industry is the result of a lowering in costs, both of material and money. Labor, however, has not decreased in a like proportion.

The situation may arise where builders will be bidding against one another for material, although from statistics available there will be sufficient material to be had to handle all jobs at a proper price.

The most serious trouble is likely to occur from labor. Many people are over-anxious to build and are crowding contractors for time. The chances are that there is likely to be a shortage of skilled labor.

Many have found that the union rate of wages in some particular trades was too high, but today we hear that many builders have in some cases paid one and one-half times and more than the union scale of wages to obtain certain mechanics. This, of course, means that the cost of building will be increased and as sure as building costs increase the demand for buildings will let up. In other words, it is a case of killing the goose that lays the golden eggs.

Let us all be careful of and keep clear of this folly, and this applies alike to material men, labor and contractors. Just recall how the price of clothing went up and up until folks just stopped buying—a buyers' strike they called it.

Rather than be gouged the public will be content to put up with insufficient housing facilities for a few years longer.

Building Apprentices

SKILLED mechanics for the building industries are required at the present time on account of the great increase in building activity; the demand for good men exceeds the supply.

During the last six or eight years but very little was done to educate young men to become skilled mechanics in the different building trades. We are now back to the days where the man that knows something will be paid a better wage than the uneducated man.

The way to improve is to have proper vocational training for our young men and when they start in to do practical work they must continue their education in their chosen trade by home study.

Any earnest young man can easily obtain reliable information about the theory of his trade from text books, night schools, correspondence courses, etc. This information he can apply practically in his daily work. What is needed is ambition on the young man's part, supplemented by proper guidance.

In an interesting article in this issue we present the opinion of a prominent labor leader on this apprentice subject. We all agree that proper training of future mechanics is essential for the well-being of the building industry.

Plasterers' High Wages Increases Use of Wall Board

IN some cases, plasterers are receiving $15 and $16 per day for their work! This is an excessive amount of pay for plain plastering work and the result will be that the intending home owner of small means will be absolutely turned against plaster on account of the excessive cost.

Wall board will come to the fore; it is easily put up and is capable of being treated by simple decorative means to be a handsome and durable wall for interior use, capable of receiving various kinds of artistic treatment.

It is an unfortunate fact that there are still some loaning institutions so wedded to the plaster idea that they will not make a loan on a house unless it is to be plastered. In other words, they are, at the present time, playing into the hands of the plasterers, helping them to keep up excessive wages and tending to put the brakes on the advancing business of the building industry. This shortsighted policy adopted by some loaning institutions is, we believe, due to ignorance of the real worth and adaptability of the newer forms for producing serviceable walls.

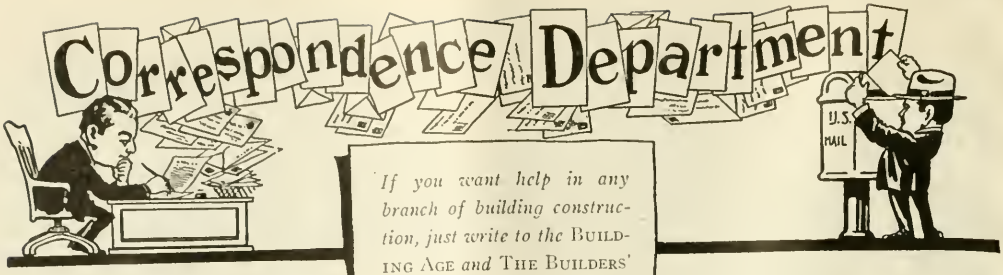
Defective Chimneys

BUILDING a chimney in the proper way seems a simple matter but that it is not done is evident from the fact that the yearly loss by fires caused by defective chimneys and flues amounts to an average of over twelve million dollars! This stupendous sum is the loss every year due to the ignorance or the willful neglect of men in the building industry who do the work on chimneys.

The principal object in building a chimney is to prevent the flames and sparks from entering other parts of the structure from the chimney. Flue lining was devised for this very purpose but too often it is not used. In other words, one saves the cost of the flue lining and burns down the building. Some economy!

The Need of a Level and Transit

EVERY building contractor will find many uses for a good level and transit. When one possesses his own instrument it is easy to have the footings laid to the exact depth called for, floors level, etc. In foundation work one footing may be under an elevator pit or etc. To get your work out of line or at the wrong level may mean an expensive change for you to make—owning and using a well-made instrument will prevent many an error.



If you want help in any branch of building construction, just write to the BUILDING AGE *and* THE BUILDERS' JOURNAL *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Is Hip Shorter Than Valley Rafter?

READING with interest the article by Mr. John Parkhill, published in the April issue of the BUILDING AGE, I note he states that an unbacked hip rafter is shorter than a valley rafter of the same run and pitch. This was news to me. Theoretically he is right, but practically he is wrong.

I feel that his statements may be misleading to students of the subject and to many of your readers, and take this opportunity of explaining the catch to prevent a misunderstanding and confusion in the minds of some.

He states "that the plane or top edge of the common rafter passes through the corner of an unbacked hip rafter and to bring the corner into this plane, the hip rafter must be shortened." This statement is erroneous.

The hip rafter is not shortened, it is dropped, but it so happens that in the dropping of the hip, it does shorten a barefoot, unbacked hip rafter, but it doesn't change the length on the center line.

If the projection be added to the main rafter and laid out in one piece notched over the plate, the length does not change, whether backed or dropped. The length on the center line of a hip or valley of the same run and pitch is always the same.

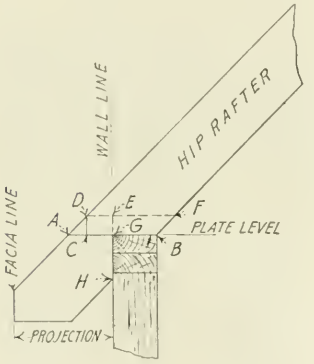


Figure 1

This is illustrated in figure 1. The rule for dropping the hip is as follows: produce a level line anywhere on the side of the rafter as the seat cut "A-B." From the top edge of the rafter on this level line, point off one-half the thickness of the stock used for the hip as at "C." From the point "C" erect a perpendicular line as at "D." The length of this perpendicular line "C-D" is the amount of stock that should be taken off the plate level as shown by the dotted line.

It will readily be seen that the actual length of the hip is shortened "A-D." The center of the hip will not touch the wall line as shown in the plan, figure 2. The center line of the hip will be set back the distance "A-B" and the outside edges of the hip will coincide with the wall lines at "C."

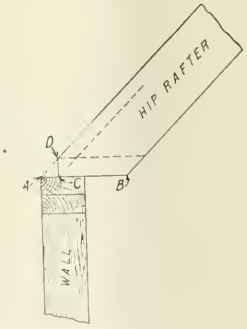


Figure 3

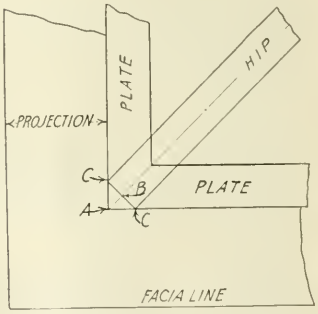


Figure 2

On the other hand, if the projection is added and made in one piece, as shown in figure 3, the length does not change at all.

"A-B" is the original seat cut for a barefoot rafter. "A-C" equals one-half the thickness of the stock from which point a perpendicular line is drawn as at "D." The hip is dropped the length of the perpendicular line "C-D." So that if the hip was backed, the birdsmouth would be cut out on the lines "B-G-H," and if dropped, cut out on the lines "F-E-H."

I trust that I have made myself clear and simplified the question involved.
—R. M. Van Gaasbeek.

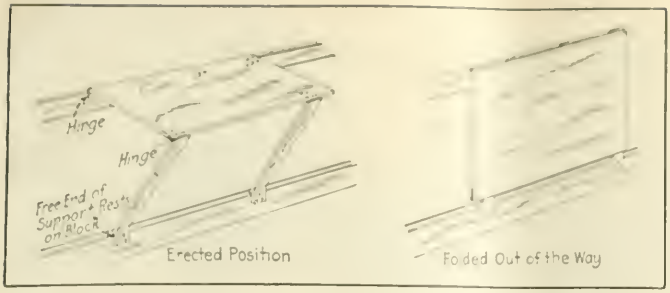
HAVE you ever used any machinery or device which has saved you time and money?

Have you ever invented any way of doing a piece of work quicker?

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Your description should tell just how you saved time and money, either by a special way of using machinery or by short cuts in construction. Point out what methods you were using before adopting your "Time Saver" and show how your new method turns the trick. You can submit as many articles as you want.

Address The Editor, BUILDING AGE and BUILDERS' JOURNAL 920 Broadway, New York City.



Drafting Board for Use in Limited Space

HERE is a simple idea for saving space in the builder's office, and also for the student or draftsman who does occasional work at home. The drawing board itself is the largest space-occupying unit of the drafting outfit; therefore if it can be readily put out of the way when not in use and as readily erected for use, a great saving in space can be effected. And this may be easily accomplished in the manner illustrated.

The drawing board should be attached to the window sill or wall moulding by means of small concealed hinges, and supported, as shown, below.—**C. Nye.**

Utilizing Odd Glass

A MASTER carpenter in a city of fifty thousand people, employing twelve men, makes the broken panes of glass his men take from windows, when they are setting new glass, a source of profit to him. They are instructed to save all the odd glass and return it to the shop, either carrying it back with them or sending it in the truck if it so happens that their kit is picked up by the machine. The broken panes are then stored in an out of the way corner of the glass room and on some rainy day the boss, himself, or his son, who works for him, goes over the lot, cutting it up into standard size.

Nothing is thrown away. From the smaller pieces, panes measuring 3" by 4" or 4" by 6" are cut: those come in handy for skylights. 3" by 10" and 7" by 9" are the next in size, utilized for cellar windows and sash of old-fashioned houses. 9" by 12", 9" by 13" and 10" by 14" are the most common sizes: these are in great demand for the ordinary sash. In some cases even larger panes are cut, 12½" by 24" or 12½" by 26", where the original size was large. The encrusted putty on the edge is scraped off, the glass washed, and then it is stored away in boxes with the size noted on a label pasted on each box.

Some of the glass is sold to customers, a reduction of a few cents on the price being made because of the fact that it is second hand; but the greater part is used up in the course of business, on jobs of setting glass requiring the standard size. —**Henry J. Carr.**

Paint Brush Hint



HARDLY anything gets one as sore as grabbing hold of a paint brush and getting one's hand all full of paint from the handle, the brush having slipped down in the paint pot until the handle was well covered.

Here is a little kink that will get rid of the whole trouble. Simply drill a little hole in the brush above the bristles, through which run a stout wire. This will keep the brush suspended in the paint and keep the handle dry.

Try it out and see if it is not a temper-saver, to say nothing about the saving in time necessary to wipe the surplus paint off the handle and one's hands.—**C. A. Orr.**

Helping the Painter

RECENTLY an article appeared in your paper about preparing work for the painter. Now here is something I would like to add to it. Don't squirt tobacco juice all around!

It's a fine stain and a hard job to remove it from floors and trim. I have found a solution of oxalic acid a good thing to use for the removal of such stains. —**Harold Freedman.**

Concrete Mail Receiver

SOMETHING new in the way of a mail receiver for the city, suburban or country home is shown in the accompanying illustration. This may be of interest to the fellow who is thinking of building a feature of this kind.

This receiver stands before a home near Whittier, California, where the dwellings and ground are of a valuable character. In selecting this feature the owner has chosen something that is durable in the extreme, for it is made entirely of concrete. This mail receiver would be an ornament to any home grounds.

It is five feet in height and the mail box portion is 10 x 18 inches, while the opening is 8 x 10 inches, being large enough to accommodate an ordinary size sheet iron mail box, if desired. The eaves have an overhang of about three inches all around. The round upright is ten inches in diameter and two feet long, the square section below, which is 20 inches square and two feet high. The base for the entire fixture is twelve inches deep and two feet in diameter.

The roof of this mail receiver has been painted green, while the remainder has been left the original finish that has been given to the entire fixture in general, known as "splatterdash."—**Albert Marple.**



MASONRY
Practical Information on Materials and Latest Construction Methods



Garden Brickwork

A Chance for Profitable Jobs Some Builders Overlook

By WILLIAM CARVER, Architect

WHEN the house is finished and the keys turned over to the owner it is customary for the contractor to consider that his work on that particular job is finished. Supposing, however, that his relations with the owner have been fairly amicable the contractor has a mighty good chance, in many cases, to get another small contract in connection with the same job. He is, in fact, in a preferred position to do any extra work as a result of his long association with the owner when building the house.

When the owner takes possession the house stands raw and bare in its surroundings. Presumably the contract has called for removal of surplus earth and for rough grading about the house.

The next step is usually to call in the landscape gardener and to proceed with the planting of shrubs. But, assuming that the owner's means have not been too badly strained in the building of his house, it is here that the contractor, working with a landscape architect or gardener, can suggest to the owner the advantage of permanent brick walls and walks, and in more ambitious gardens of pergolas, summer houses, or other features as conditions warrant. Such features not only improve vastly the appearance and value of the property, but add to the owner's enjoyment of it.



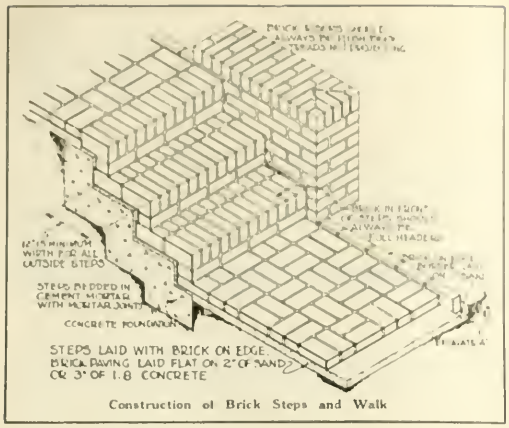
Brick Walls with Arched Entrance Lends an Artistic and Quaint Enclosure for the Garden

Brickwork, by its nature and tradition, is naturally associated with garden architecture. With its beautiful colors and soft texture it blends well into any garden, formal or otherwise. When studying the celebrated gardens of Europe, and beautiful gardens which dot the landscape in various parts of the United States, one is impressed with the cool, inviting, and harmonious appearance of a background of rich red brickwork against green foliage and shrubbery.

On a hot summer day nothing looks more thoroughly inviting than a corner in a garden with spreading trees giving shade from above and ivy covered walls shutting out the horizontal shafts of heat and light. Add to this a brick walk stretching to the house and providing a streak of welcome color through the garden.

Probably much of the pleasing effect of brickwork is due to the fact that it does not glare in the sun. It does not reflect sunlight, but absorbs it, and is restful to the eye, contrasting with the green foliage and grass at the same time.

There are many selling points for garden brickwork which the contractor can use when discussing the matter



Construction of Brick Steps and Walk

with the owner. The privacy which brick walls afford should not be overlooked and this is not only an advantage in the summer time, but is of much more importance in the winter, when shrubs and trees have shed their foliage and no longer serve as a screen.

The cost of brickwork in the garden is not necessarily great, and the extra expense is well justified by its qualities of permanence, to say nothing of its beauty.

Where walls are used to divide the same property, and consequently do not have to follow a boundary line, such walls are built with a continuous wavy plan to give them stability. Thus laid out, four-inch walls are frequently built seven and eight feet high. Straight walls four inches thick are built up to four or four and a half feet high, generally reinforced at intervals of about five feet with nine-inch square piers. Thus built, a brick garden wall will last as long as a brick house—around the century mark.

Walls should be carried below the frost line, but do not need a spread footing, except that four-inch walls should be laid on a course of headers placed on edge to insure maximum stability.

A course of brick on edge laid in rich cement mortar forms a neat and effective cap for walls eight inches thick and over. Immediately below this cap a course of shingle roofing tile or slate projecting about an inch on either side forms a drip and adds to its effective appearance, beside being useful.

Brick walks may be laid to have a variety of effects. Many people like to see a brick walk laid unevenly, probably with grass growing up in the joints; as in old walks.

The walk may also be laid in a variety of patterns, a very pleasing arrangement being the herringbone or criss cross pattern. This is, however, naturally a little more expensive than patterns in which the brick are laid square with the walk.

The brick may also be laid on edge or flat, the different size of the exposed surface of the units not only allowing a variation in effect, but also making a difference in the price of the work, brick laid flat requiring fewer brick. If an uneven effect is wanted, bed the bricks on sand, with vertical joints either sand joints or mortar joints. If it is not desirable to have vegetation appear in the joints, mix salt with the sand.

Bricks for walks, steps, or any floor surface should of course be only the hardest burned brick, and it is advisable to state the purpose for which these brick are to be used when ordering them.

On a hillside, or where there is a change in grade, brick steps can be advised to advantage and such steps also form charming ornaments in the garden. Steps should be laid on concrete, not sloped on its under surface, but stepped off so that it cannot slide out of place. Joints should be filled with mortar.

For porch floors, too, brick paving is very extensively used, its warmth of effect and economy making it a very desirable material for this purpose. Porch floors should always be laid on a concrete base, with mortar joints.

Joints in outside steps and floors should always be filled with rich cement mortar. A very effective joint is the thumb joint—a broad, slightly concave joint thoroughly rubbed with a steel jointing tool. Sometimes, in the best work, the face of the brick is given a coat of raw linseed oil before being laid, which prevents mortar sticking to it.

Pergolas, gate posts and summer houses, all these, too, come to mind as items of construction and embellishment which may be suggested by the contractor when conditions and extent of grounds would warrant their construction. It is sound business to develop one's market to the utmost for the commodity one has for sale.


Brick Wall and Wood Lattice Make a Good Combination



CARPENTRY

Good Practice in Frame Construction and Finish

How to Frame a Roof of Unequal Pitch

By RICHARD M. VAN GAASBEEK

School of Science and Technology, Pratt Institute, Brooklyn, N. Y.

UNEQUAL pitched roofs are those formed by the intersection of two roof surfaces having different pitches, one surface sloping more than the other. The hip and valley rafters form the dividing line. The roof surface on one side of the rafters being framed to one pitch and the roof surface on the opposite side of the rafters to a greater or lesser pitch.

The plates for the two roof surfaces are at different heights, those on the short common side or steeper pitch, being higher than the plates on the long common side or lower pitch. The hip and valley rafters travel the diagonal distance of an oblong with reference to the plate in comparing them with the framing of a hip and valley rafter for a roof of equal pitch, which travel the diagonal distance of a square and cross the plate at an angle of 45 degres.

The center lines of the hip and valley rafters must intersect the facia line at the extreme corners or returns on the facia line, and because they travel the diagonal distance of an oblong, they are thrown to one side of the corner of the building or the return walls, crossing the plates at an angle to one side of the corner of the building. The common and jack rafters, as in any other roof, cross the plates at right angles. This roof creates several interesting framing problems, which at first may appear difficult, although simple, when once the basic principles are understood:

Specifications

Plate, long common side, 7/8″ by 2½″.

Plate, short common side, 7/8″ by 3⅛″.

Hip and valley rafters, ¾″ by 1¼″.

Common and jack rafters, ⅜″ by 7/8″.

Ridge, ⅜″ by 1⅛″.

Projection, 2″.

Facia, 5/8″.

Plancher level to plate level, short common rafters, 2⅝″.

Plancher level to plate level, long common rafters, 2″.

Pitch, long common rafters, 12″ rise in one foot, (½ pitch).

Dimensions. (See plan, Fig. 1.)

Rafters, spaced 2″ on centers.

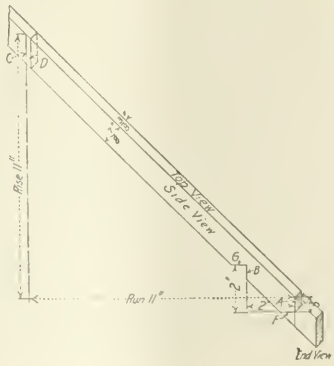


Fig. 3—Developed Length of Long Common Rafter No. 16

Lay-Out

A full size working lay-out of the plan (Figure 1) should be drawn on a board or sheet of detail paper. The lay-out will represent a scale of 1 inch to the foot. In applying the various measurements full size, substitute the word feet for inches in listing the runs and lengths of the rafters.

Number each rafter and ridge as shown on the plan. Put the corresponding numbers on the rafters as they are laid out so as to insure ready identification and proper location during the erection of the roof.

It will also be necessary to develop a profile of both the long and short common rafters on the layout, as shown in Figure 2, so as to determine the proper heights of the walls or plate levels. First, draw a profile of the long common rafters, the specifications calling for a half pitch roof, or the rafters rising 12″ in one foot of run.

In a half pitch roof, the run and the rise is the same, so if the run of the long common rafter is 11″ (see plan Figure 1), the total rise of the rafter must also be 11″.

With the total rise of the roof known draw a profile of the short common rafter, the run of which is 8″, thus determining the pitch of the short common rafters. In accordance with the specifications which give the desired width of the facia and projection, locate the plate levels on either rafter.

It will be discovered that if the plates on walls J-K and L, which support the long common rafters, were on the same level or height as the plates on walls M-N and O, which support the short common rafters, the birdsmouth on the long common rafters would almost cut the rafters in two.

To overcome this difficulty the plates on walls J-K and L, which support the long common rafters, are dropped sufficiently to get a good seat cut on the plates and yet not weaken the rafter at the birdsmouth.

With the birdsmouth developed independently on both long and short common rafters, measure the height of each plate level from the plancher level and subtract the two figures, which will give the difference in the heights of the two plate levels, the plancher level being level throughout the entire roof.

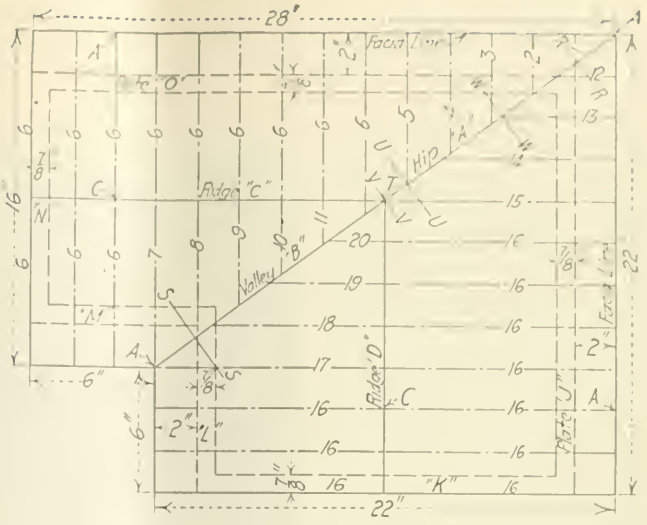


Fig. 1—Plan of Hip and Valley Roof of Unequal Pitch From Which Layout Is Made

To Lay Out Long Common Rafter

The pitch of long common rafters No. 16, required by the specifications, is 12″ rise in one foot. The run is taken from the lay-out, Figure 1, measuring from the facia line to center line of ridge "D", A-C, or 11″.

Set the fence and square at 12″ rise on the tongue and 12″ run on the blade. Mark on the tongue for all plumb cuts and on the blade for all level cuts. Press the fence firmly against the top edge of the stock to be used and produce the facia line or first plumb line to the extreme right, A, Figure 3.

Slide the fence to the left and measure on a level line from facia line A, the run of the rafter, 11″ and produce plumb line C, Figure 3, the extreme length of the rafter to the center line of ridge D. From this length deduct one-half the thickness of the ridge, 3/16″, and produce plumb line D, the cutting length of the rafter against the ridge.

To complete the lay-out of the lower end of the rafter, measure in from facia line A, measuring on a level line, 2″, the width of the projection, locating wall line B.

Measure down on facia line A, from the top edge of the rafter, 5/8″, the width of the facia, locating plancher level F.

Measure up from plancher level F, measuring on a plumb line, 2″, (Note: Take this distance from the lay-out Figure 2), locating plate level G. Cut on line A for the facia, on line F, for the plancher level, on lines G and B for the birdsmouth, and on line D for the cut against the ridge.

In the next issue the method of finding the developed length of the jack rafters will be discussed.

The problem of the unequal pitch roof is a very interesting one, and every student of roof framing will find that there are many points to be considered so as to obtain a good job without constant cutting and trying.

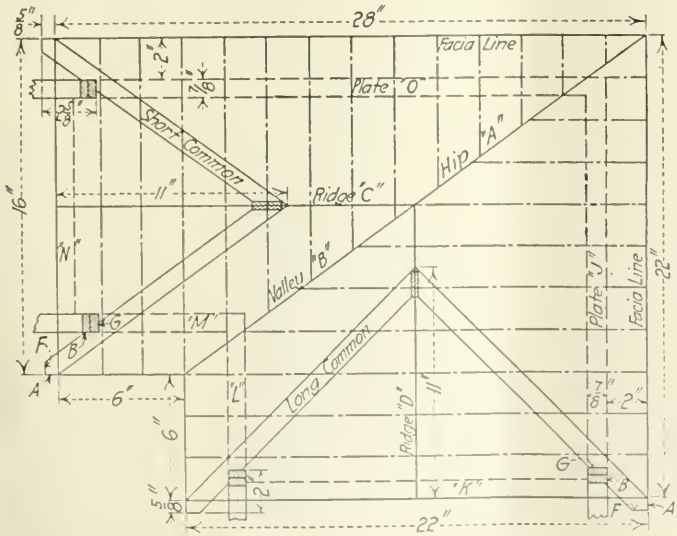


Fig. 2—Common Rafter Developed on the Plan—With the Top Pitch Projection, Width of Facia and Plancher Levels Known, the Heights of the Plate Can Be Determined

Detail for Stucco Porch Construction

Practical Instructions on How to Build a Wide Span Porch

By I. P. HICKS

MANY bungalow houses are now being built with a stucco exterior finish and with wide spans between the porch columns. There are many of them where there are but two columns, even when the porch extends all the way across the front of the house. When built in this way the columns and the porch beam should be built very large and strong, which gives the structure a massive and grand appearance.

This kind of construction makes it absolutely necessary to build a strong porch beam, one that will be sure to carry the weight of the roof without any danger of sagging. Our sketch shows how to build such a beam. Take two 2x12's of the required length, space them the proper distance apart, frame in a 2x4 or 2x6 on the ends as shown, spike on a 2x4 or 2x6 on the bottom in the center, then put in a ⅞-inch truss rod from end to end and with a wrench turn the nuts up tight. With this kind of construction you can safely span a 24 foot porch with only two columns. For spans up to 26 or 28 feet we recommend three 2x12's and two ⅞-inch rods.

The furring at the bottom is necessary for there must be depth to the beam in order to give strength to the truss. The furring could be made a little less. It could be cut down to about 1½ inches by using a metal plate on the bottom of the beam instead of the wood. The plate should be about ½ inch thick and 6 inches wide. This would really be better than the wood for the iron truss rods might cut into the wood, which would be the result in case of great weight coming on the beam. For safety use the iron plate over the bottom of the beam and also put an iron plate over the 2x4 at the ends of the beams. When this is done you should have a beam that should never fail to carry the load placed upon it.

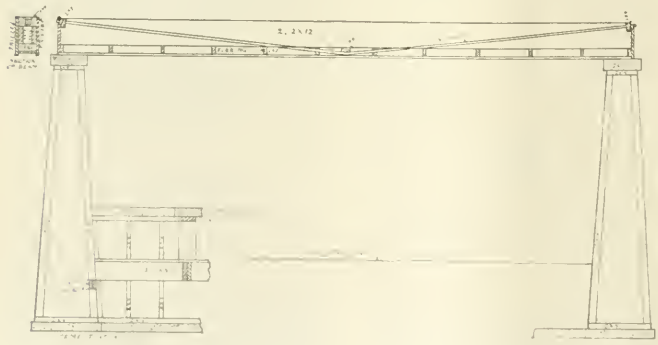
Build the columns strong and large so that they will look massive and in accord with the beam above. They should be about 2 feet 6 inches square at the bottom and 1 feet 3 inches at the top for the frame work. The frame work should be braced diagonally across the columns in order to keep them square and should be bolted to the cement base at the bottom.

The columns can be sheathed up with Bishopric stucco board. It gives strength to the column and is an ideal material over which to apply stucco. Do not use wood lath over the beam or the column caps, use metal lath of an approved make for these places. The shrinkage of wood lath in such places is sure to result in unsightly cracks in the stucco finish. See that the furring is well nailed and that the metal lath is securely fastened to the furring and that the lath is well lapped where the joints are made. You must have solid and well built work if you are to get a satisfactory job, all of which can easily be had if due care is used in the construction work.

Put in a cement stone base at the ground line of the column. In fact every house that is to be stuccoed to the ground should have a cement stone base run all the way around just at the ground line and to extend 4 inches above the ground. This makes a fine place for the starting of the stucco and being a little above the ground it does not have the tendency to get dirty.



The Type of Porch Needing Special Framing to Support Rafters



A Method of Framing to Support the Rafters

Prize Winning Remodeling Job

Interesting Alteration of Old Saloon Building Into Modern Office Structure

NEW buildings for old sounds somewhat like the tale of Aladdin and the Wonderful Lamp. But many remodeling jobs have lately been finished that are truly remarkable in the great change that they have made in the appearance of an old, dilapidated building.

In our January issue we showed pictures of the remodeling of an old but well built office building into a modern structure for the International Mercantile Marine Company. This was a very interesting job, and was awarded first prize by the Downtown League of New York for the best alteration job in 1921. The second prize was made to Errett, the Lily Cup man, for the alteration of a very unattractive saloon and tenement property at Fulton and Water Streets, in New York.

This whole building was remodeled into a clean little office building that adds dignity to the neighborhood. The appearance of the building before alteration was exactly the same as the building to its right. A similar building is shown on the left, with one building intervening.

This modern office building used to be a dingy saloon with characteristic projecting doors and a "ladies' entrance" under the old-fashioned outside steps, which led to a ramshackle factory above, itself provided with an unsightly fire-escape. The present appearance of the adjoining property gives you the idea.

Under the direction of J. J. Diemer, architect, James C. Hoe's Sons, Inc., builders, took out the insides of building and replaced with modern steel construction "and everything." The old hoistway was rebuilt to be occupied by an Otis automatic, electric elevator, and the old steps gave place to a new fireproof inside stairway, cellar to roof.

Tiled floors were laid on all floors, steel windows installed, interior walls covered with black oak wainscoting. Black oak beamed ceilings with cement plaster panelings, black and white wash-rooms, and the black and white entrance gave the Lily Cup trade-mark. In the cellar an automatic gas-heated steam boiler was installed.

Outside, the saloon appearance was removed by altering the window openings, erecting an arched iron doorway, and facing the entire front with white Portland cement. John Gallin & Son, the mason, did this.

An immense steel sign with great enameled steel letters like kid's blocks stands high above the roof. Lighted at night it announces to passengers on the Brooklyn Bridge, to night workers in downtown office buildings, and to folks who loiter in the neighborhood of City Hall, that this is the New York home of a progressive manufacturer.

It is rather interesting to note what great improvements can be made in old buildings to have them modern in appointments and artistic in design. There are many thousands of good substantial buildings that are relics of a bygone age when folks only thought to build strongly without giving any thought to architectural design.



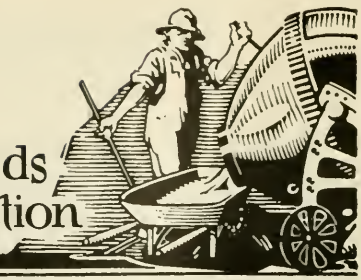
Buildings of this sort offer a very profitable field of work for the building contractor. Make suggestions of what can be done and show a sketch to the owners and interest will be aroused and many an order secured this way.

Main Street in most of our older towns certainly presents a very unattractive appearance to our modern eyes and tastes. Builders, by working in conjunction with their local Chamber of Commerce, can stir up considerable interest in making a town beautiful.

One of the biggest arguments to use to put over this idea is that it will pay for itself in increased trade.

CONCRETE

Form Work-Reinforcing Methods Monolithic and Block Construction



A Few Concrete Hints

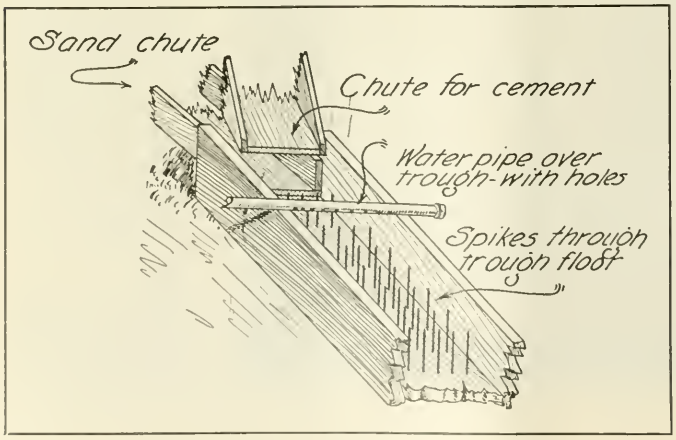
By DALE R. VAN HORN

HERE is a novel way of mixing concrete by the action of gravity which was used on a large concrete job. The work to be done was at the bottom of a rather narrow, but deep ravine and the nature of the work consisted of the erection of a concrete dam across the bottom. This job was staged some thirty miles from a shipping point and after it had been decided that the dam was to be put in, search was made, and in vain, for a mixer.

The foreman of the ranch on which the work was being done had seen a bit of country. And having seen, he had also observed as he went along. So that, all in all, he was a pretty practical fellow. He suggested the mixing of the mortar by sliding it down a trough laid on the bank of the ravine. Providing proper and necessary precautions were taken, he said, things should turn out all to the good. And since he bossed the job, things went as intended and did work out all right.

By means of the accompanying drawing and a short description which follows, you may be able to dope the thing out and at the same time tuck away the idea, with such changes as may be necessary for your particular environment, and at some future time put it to good use.

A temporary tank was placed some distance farther up the bank from where operations were to be staged. From this was run a length of old pipe which was found. A cap was screwed onto the other end and eight small holes about three thirty-seconds of an inch were drilled near the end in a space eight inches long. Between the tank and the lower end of the pipe, a valve was placed so that the amount of water could be regulated to suit the condition of the sand and cement.



In the drawing is shown the trough, two chutes and the water pipe as they were installed. The trough consisted of a ten-inch plank for the bottom with two six-inch planks for the sides, each eighteen feet long. At regular intervals, about two inches apart, each way, spikes were then driven through the floor of the trough from the under side, leaving about three inches of the ends protruding, as shown.

Two chutes were introduced into the upper end of the trough, one above the other, and each at an angle sufficient to insure the moving of the material as soon as it was placed there.

The chute for the cement was run back and to one side and connected to a small hopper, with an adjustable door so that the quantity of cement passing through in a given time could, too, be regulated.

With a little practice it was found that one man, shovelling steadily and at a moderate rate, could furnish the aggregate for the finished mixture. The water supply valve and the door in the cement hopper were then adjusted accordingly.

The trough, when set on the bank, was about forty-five degrees from the horizontal and the lower end

emptied into a wide, shallow receptacle, from which the concrete mixture was carried by the two workmen below to the forms of the dam.

On small jobs when the chance presents itself, the use of gravity for this purpose will come in handy, since considerable time will be saved in the process, the amount depending upon the size of the job and the speed with which the ingredients are run through the stages.

Omitting Reinforcing

It is surprising how some folks will want to save a little money by omitting some really important part of construction, bracing and reinforcement seem to be items often picked upon. We illustrate here a couple of examples of what is likely to result by omitting the reinforcing in concrete work.

In one case the owner was laying a concrete foundation for a barn. Thinking that he could effectively cut the cost by doing this work himself with the aid of two hired men, he apparently was taking every precaution against possible failure. The forms were filled, the bolts were placed for the sills and in due time the carpenters and contractor arrived and the barn was built.

Six months later, a large crack appeared at three of the four corners of the foundation. Perplexed, the owner went to the contractor and sought his opinion.



Wall Failure in Solid Concrete

"Did you reinforce the corners," the contractor asked.

"No."

"Why not?"

"Didn't think it was necessary," the owner replied.

That short conversation seems to contain a lesson. Because the owner thought that he knew the rules of the game, the very foundation of the structure was weakened. Two years later one side of the barn had settled to such an extent that it was necessary to remove the wall and replace it. The cost doubled the original cost of the foundation. It would have been much cheaper to have left the whole program in the hands of one who knew what to do.

If you know how to do it, all right, but be sure that you do. First, be sure you're right, then go ahead. That simple slogan would have meant money saved to this owner.

While on the subject of construction, it might not be out of place to consider, briefly, retaining walls. The cut showing a fractured corner of concrete blocks is but a common example of what results when such walls with side pressure are built regardless of the existing natural laws.

A compound fracture exists here. The wall has not only given way, due to lack of reinforcing, but the lower corner blocks have been split, due to uneven settling. A little extra time spent here when building, would have prevented the trouble.

This long crack is due to the uneven settling of one wall and also to the tipping outward of the other, due to this side pressure.

Two things would have prevented this damage: if the foundation had been laid on solid ground, or upon earth properly prepared, the settling would not have taken place. The use of reinforcing would have prevented the second.

No matter how sound concrete blocks are constructed, they give way, if the force exerted is sufficient. The reinforcing should have been quarter-inch rods, bent at right angles and the ends bent down or up, to fit into the first joints.

Shovel for Concrete

When mixing thin plasters and mortars an old square point shovel which has been slightly altered to suit the occasion, will come in handy. If holes are cut through the sheet metal large enough to let considerable mortar through at each stoke, the mixing will be much more rapid than in the ordinary way.



Another Wall Failure

Mark lines on the back of the shovel proper two inches apart and over an area extending from a point two inches from the blade to where the hump shows the location of the lower end of the handle.

Drill holes on these lines, two inches apart and afterward smooth off the rough edges left by the drill. This alteration will take care of mortar which includes a medium grade of sand as the largest of the aggregate.

If a shovel is wanted for slightly larger or coarser work, or work which will not contain quite as much water, drill holes in pairs one inch apart, with a five-eights inch drill and then with a cold chisel cut away the narrow intervening metal portions between the pairs of holes. This process leaves holes five-eights of an inch in width and not quite two inches long.

In mixing concrete it is knowledge gained by experience that will tell a man when the mixture is just right. Lack of enough water results in a dry or mealy mixture and too much water results in a soup that is bound to run out of the forms and carry most of the cement with it.

WHAT'S NEW



New Materials and Equipment that Keep Your Work Up to Date



Device for Fastening Wallboard

AFTER two years of experiment, the Upson Company, manufacturer of wallboard products, has recently placed on the market a little device which not only makes the putting up of wallboard easier, but produces a better job.

Carpenters have tried for years to make a good job of applying wallboard by countersinking nails. But nail-head depressions are almost impossible to conceal successfully, even by the best of painters.

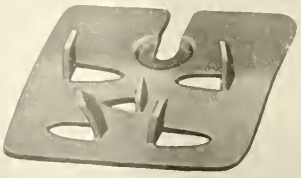
This great little improvement, known as the "Upson Self-Clinching Fastener," eliminates this one big objection. The fasteners are nailed to the studding, prongs outward, before the wallboard is applied. A piece of 2x4 is then placed upon the wallboard panel over the fasteners, and a few heavy blows are struck upon it with a hammer.

The prongs firmly clinch the wallboard from the back. The surface of the board is not marred or disfigured in any way—a clear, unbroken spread of paneling is ready for the painter.

Like most of our every day conveniences, the outstanding feature of this fastener is its simplicity. It is made of tempered steel, and is about one inch square. It has five prongs. One of these is straight, and the other four are curved. The straight prong holds the panel so that it will not move from side to side. At the top of the fastener is a nail slot for fastening it to the studding.

Tests have been made demonstrating that one fastener will hold more firmly than nine finishing nails.

The use of this fastener cuts down the cost of installing wallboard by one-half. It eliminates the tedious labor and cost of countersinking hundreds of finishing nails. It does away with the cost of filling nail holes —a difficult thing, seldom done perfectly.





The introduction of this fastener appears to be one of the biggest steps in the development of the wallboard industry. It is the final step in the use of quality wallboard in the finest of homes. As the wallboard is held firmly in place at every stud handsome wall paper can be used without fear of cracking, as bulging is entirely eliminated.

Handy Saw Table

HERE is a portable machine that can be easily moved by two men and is especially desirable for use on repair or new jobs where it can be carried from floor to floor and from room to room. It is operated by an attached electric work. The size of the table is 18x24 inches and it is 3 feet from the floor. The weight is 170 pounds.

It is a light weight yet strong machine and is manufactured by the American Saw Mill Machinery Co., Hackettstown, New Jersey.

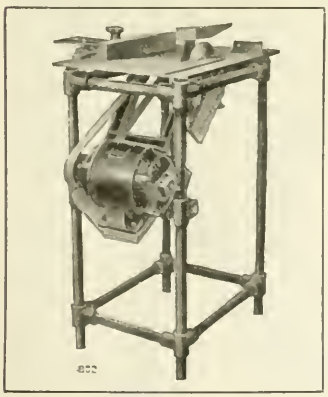
A light weight strong machine, having tubular steel legs cast into corner fittings, forming an inseparable rigid frame to which the steel top is attached. This frame also supports the swinging arm or yoke which carries the saw mandrel.

When fitted for belt drive the countershaft turns in babbitted bearings. When motor driven the motor is mounted on a wood base attached to the swinging arm and belt centres do not change in adjusting the saw.

The illustration shows the motor running clockwise. When a non-reversible anti-clockwise motor is used the position of the motor may be reversed.

The saw may be raised or lowered and is held in any position by means of a positive clamp, a convenient handle being provided for raising and lowering the arm.

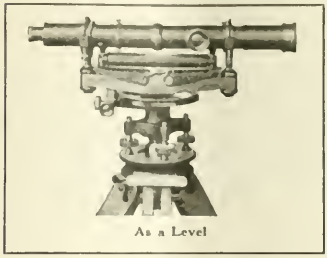
A slot is planed in the table for cut-off gauge which is supplied with each machine. This gauge can be set at any angle, right or left, for mitre work.



An excellent stopping gauge is provided which opens 8½ inches from the saw and is held in any position by a quick acting clamp. It is adjustable for alignment with saw and can be removed quickly for long cut-off work.

Safety guard and splitter and guard is provided, the saw being guarded both above and below the table.

The construction of the machine is such that it may be changed from belt to motor drive simply by removing the pulleys and mounting the motor, no extra parts except the wood motor base being required. A motor driven machine can be changed to belt driven by the addition of the countershaft and pulleys.



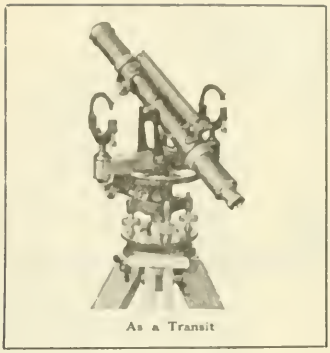
As a Level

Combination Level and Transit

BUILDERS are just as anxious to obtain results quickly as well as accurately and this is true of leveling as well as other operations.

The new Sterling level as shown here is made by the Warren-Knight Co., Philadelphia, Pa. It is a level that can be instantly changed to a transit (for sighting points above and below the level of the instrument) without the use of detachable parts and free from all of the drawbacks of the usual makes of levels.

The top of telescope is free from projections which would obstruct free sighting. The convertible device consists of two permanently attached hinged uprights for instantly changing the instrument into a transit with a range of over 45 degrees of elevation or depression in the vertical plane and provided with spring tension trunnion clips for frictionally retaining telescope in any desired position. The uprights may be folded down against the level bar when not in use.



As a Transit

Asbestos Building Lumber

THE high cost of installing tile work in the bathrooms and kitchens of our moderate cost homes have made builders to look for some other suitable material that would give a good appearance and that will stand the hard wear that such a wall is necessarily subjected to.

Ambler Asbestos Building Lumber is such a material. The Asbestos Shingle, Slate & Sheathing Company of Ambler, Pa., manufacture this building lumber in thickness of 3/16 of an inch up to any desired thickness and it can therefore be used for a large variety of purposes.

For wainscoting this asbestos lumber can be had grooved in squares or oblongs and furnished with a moulded cap of the same material which may be used to give a tile effect at a very nominal cost.

This asbestos lumber does not require painting for a finish, but if such is desired it can be used. Some very pretty effects can be obtained by having a stenciled border on some of the tile-like divisions of the wainscot, etc., thus it lends itself to simple artistic treatment.

Asbestos building lumber, within a moderate length of time after it is manufactured, can be treated very much in the same manner as wood, since it may be sawed, chiseled, planed, etc., and nails driven through it without cracking; it seems to become tougher and harder with age.

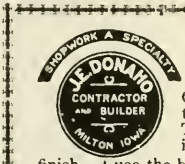
As it is a fireproof material it has many uses in electrical installations as it is also a non-conductor. For houses with wallboard walls it is an excellent material to be used on the wall space behind the kitchen range, as it is fireproof and also a good heat insulation.



BUSINESS GETTING METHODS

Ideas that have worked for others

How One Builder Advertises



KEEP OUT THE FLIES

MY FULL SIZED WINDOW SCREENS are made from Clear Cypress Lumber thoroughly dried. All joints are morticed and tenoned to prevent warping, sagging or opening. The edge of the wire cloth is covered with plain screen mould ing carefully fitted into place, insuring a neat workman like finish. I use the best GALVANOID screen wire cloth obtainable. I recommend the use of Galvanoid Wire Cloth, which costs only a few cents more than the black wire, and has a far much longer life. Galvanoid Wire is a STEEL WIRE. Galvanized before it is woven. Then is Re-Galvanized after it is woven and then run through a transparent VARNISH BATH.

All my screens are made from 1-1-8 Clear Cypress and are made to order only As these screens are made from Clear Cypress Lumber they are furrished pain ted, two coats with best drop black paint, unless otherwise ordered As they are made from clear lumber there are no defects to conceal, and the quality is suitable for either Natural Finish or paint.

I also make SCREEN DOORS, which are made up of the same kind of material and I ean furnish these doors to you in just the plain door or the combinatlon screen and storm door, painted or unpainted, any style or size made to order. I can furnish you these on short notice, no Competition closer than the mill. Send me your list of Screens for estimate, before placing your order.

(I also carry a full line of screen wire at all times.)

J. E. DONAHO, MILTON, IOWA.

FLY-TIME is about here and there will be plenty of people wanting screens. The past few months would have been the best time to have had made these, but most folks will usually wait until the last minute before ordering anything, and this is true of screens as well as of nearly everything else.

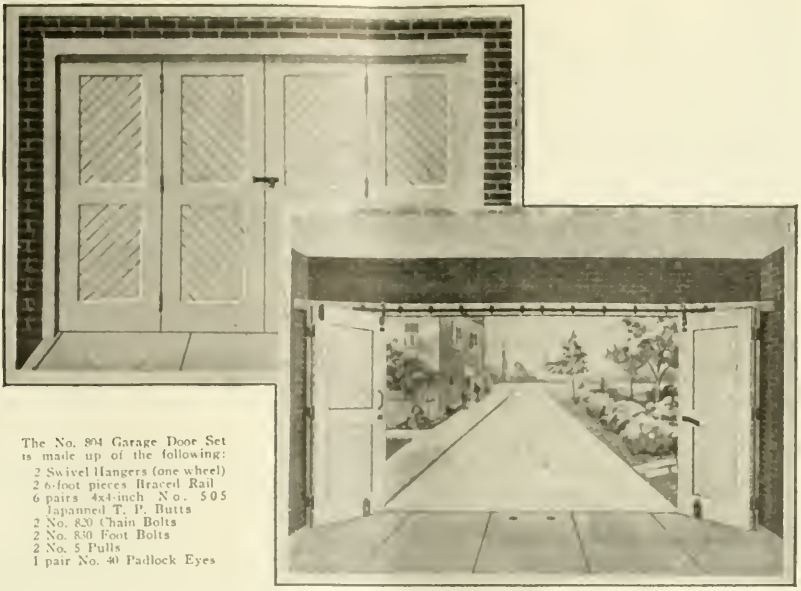
In the illustration given above we show one side of an interesting card which was recently circulated by a progressive builder of Iowa to every house in his town. The reverse side of this card contained a large illustration of a fly. Mr. Donaho has several other interesting cards that he uses from time to time. Each one of them has the trade-mark which is shown on the upper left hand corner of this screen card. It is a good plan to have a trade mark and use it on everything, stationery, signs, etc.

The making of screens is, of course, a very simple job, but there is a way of making them better. Years ago folks were content to just simply have screens, and they did not care how the frames were made or what hardware was used to keep them in place, and a poor quality of wire screening, or even cotton fly netting, was generally used. Of course, these screens soon rusted away and the frames came apart. Substantial construction pays, both on the house and on its equipment, and screens should receive the same amount of careful attention as any other part of the house. When well made, they will last a long while.

Particular care should, of course, be taken in making the corners secure. The custom has been to just mitre the corners together, and use a few crimped nails to hold them in place. This kind of screen soon parts, and is unsatisfactory after a few years. For temporary work, of course, this cheap method of manufacture is allowable.

Today one can obtain different kinds of screen hardware which really have many advantages. Screens can be hinged so as to open like casement windows, and for screen doors there are many different sorts of spring hinges and different catches. The old hook and eye bolt is rapidly being displaced by some respectable-looking hardware that gives a certain class to the entire outfit.

Where a large number of screens are employed on a building, it is wise to have them numbered. Nowadays one can buy duplicate numbered tacks, one to go on the screen and the other to go on the window sill, etc. In this way there is no trying each screen to see if it will fit in a certain place when putting them up.



The No. 804 Garage Door Set is made up of the following:

2 Swivel Hangers (one wheel)
2 6-foot pieces Braced Rail
6 pairs 4x4-inch No. 505 Japanned T. P. Butts
2 No. 820 Chain Bolts
2 No. 830 Foot Bolts
2 No. 5 Pulls
1 pair No. 40 Padlock Eyes

When You Install A National Garage Set You've Got the Best There Is!

And the best is none too good when the qualities of the job you turn out are at stake. Doors that open and close easily and do not sag; doors that require a minimum of space when open, and are weather-tight—such are proofs of the judicious selection on your part of a good Garage Set.

The No. 804 Garage Door Set illustrated, features each of the above points and in addition allows for a hanger construction permitting doors to swing into opening against stops. Neither snow nor ice will interfere with the opening and closing.

This set works as freely and easily as any house door—simply push and the doors are open; a slight pull and the doors are closed. Complete instructions accompany each set that comes packed complete in a box.

Each style of door—every sort of garage—has its own type of Door Set peculiarly adapted for that use. Above is shown our No. 804 and our catalog illustrates and describes a number of other styles. Write for copy of our "National Garage Hardware" Catalog.

NATIONAL MANUFACTURING CO.

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CONTRACTING EQUIPMENT

Reliable Information on Time and Labor Saving Devices

Side Walk Sheds

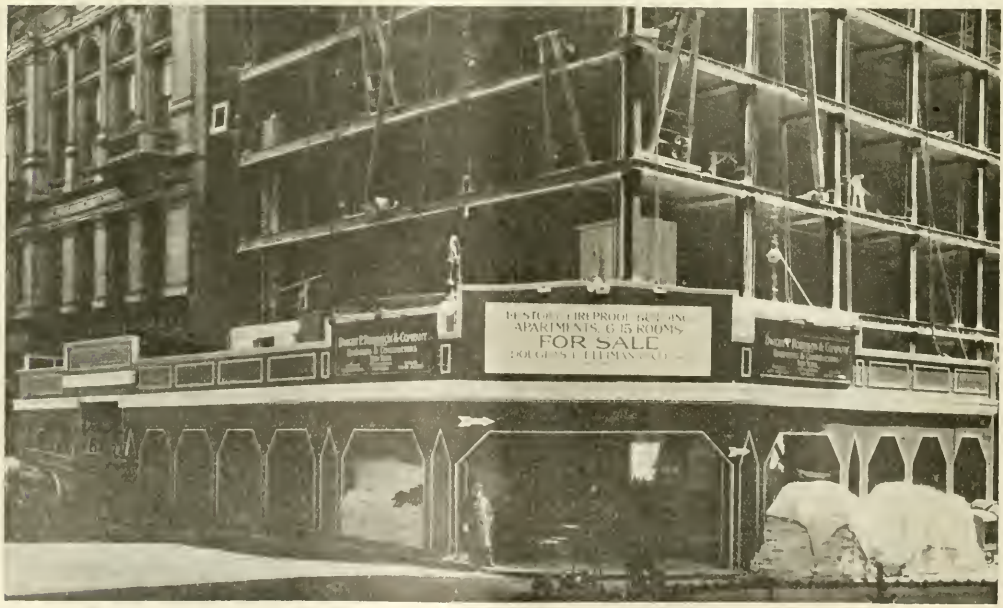
IT is a requirement in nearly all large cities that whenever a building or any part thereof situated within 10 feet of the building line, is to be raised to exceed 40 feet in height, a Side Walk Shed is to be used for the protection of pedestrians. This rule also applies when buildings are being demolished.

Naturally such a shed, which needs to carry quite a heavy load, must be very substantially built. It is usually made of heavy timbers as supports, with good solid joists and heavy planking for flooring. Unfortunately, this construction is more substantial than elegant, and it is usually an eyesore while it is in place. It seems to be one of the necessary evils in building.

Of late years there has been a tendency to make this Side Walk Shed a little ornamental, and in the picture below we give a very interesting example of this. This particular Side Walk Shed was erected by Dwight P. Robinson & Company of New York, on a new building operation at Park Avenue and 58th Street, where they are building a large fourteen-story apartment house.

This Side Walk Shed is stoutly built, and has been well finished with new lumber, and it is painted with two coats of dark olive green paint with buff trimmings. Besides serving for building construction purposes, it also serves as a good publicity space, as it supports four electric signs which are illuminated at night.

A protection of this character makes a side walk safe, keeps the premises clear of materials, and directs favorable attention to the building operation, impressing the public mind in a definite way that a construction project is going forward by some wide-awake and careful contracting firm.





Enduring attractiveness and low repair costs

THE same qualities in Redwood which assure enduring beauty to these houses in the Country Club District of Kansas City, make excellent selling points for the building contractor in marketing one or a dozen houses protected by enduring Redwood.

Redwood is not subject to any form of decay. A *natural*, odorless preservative permeates every fibre of Redwood during the growth of the tree and protects it against fungus diseases and against boring worms and insects. Seasoning does not destroy this preservative. Exposed to the weather or in contact with ground moisture, Redwood remains sound indefinitely. This keeps repair costs low.

Redwood's uniform cell structure gives the wood a firm, even texture and excellent working qualities. Waste is cut to a minimum and labor costs are smaller.

Redwood takes and holds paint unusually well and thus paint lasts longer in good condition. Re-painting is required less frequently.

Redwood's freedom from resinous compounds reduces the fire hazard.

Redwood lumber and millwork can be bought at prices little higher than for wood which cannot compare with it in rot-resistance or proportion of clear lumber, free from ordinary defects. T. P. L. Co. Redwood is properly seasoned. It does not warp, shrink or swell.

Using Redwood you can emphasize these points. They make selling easier.

Builders and architects will be interested in our "Construction Digest" and our "Engineering Digest", and also in our new "Redwood Homes Booklet". Our New York or Chicago office will gladly forward any or all of this literature.

THE PACIFIC LUMBER CO. of Illinois
2070 McCormick Bldg. Chicago — 832 No. 40 Rector St. Bldg. New York City
THE PACIFIC LUMBER CO.
San Francisco — Los Angeles

Redwood should be specified for

Exterior Construction—
including — Colonial siding, clapboards, shingles, door and window frames—gutters, eaves, water tables and mud-sills—porch rail, balusters and columns—mouldings and lattice. Pickets and fencing —Pergolas and Greenhouses.

Interior Finish
Natural, stained or painted Wood block floors.

Industrial Uses
Tanks and Vats for water chemicals and oil. Factory roofs and gutters — Wood block flooring.

Wood Specialties
Such as—Caskets and burial boxes — Incubators and ice cream cabinets and Cigar and candy boxes, etc.

Railroad Uses
Such as — Railroad ties and tunnel timbers — Signal wire conduits and water tanks — Car siding and roofing.

Farm and Dairy Use
Such as — Silos, tanks and troughs—Hog feeders and implement sheds — Wood block floors, etc.

T P L C

The Pacific Lumber Co.

Redwood

The Largest Manufacturers and Distributors of California Redwood

"The Western wood for Eastern homes"



Legal Department

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age and The Builders' Journal, 920 Broadway, New York City.

IN October, 1919, B was taken by V to the latter's mill with a view to B doing some expert mechanical work on it. On the way there V asked B what his charges would be. B replied that he was then getting $10 per day and expenses, including board and carefare, etc. Nothing more was then said about wages. In November V's brother asked B what the charge would be, and B replied that V knew all about it. The weather being unfavorable, the work was not commenced then. But in August, 1920, it was started, without any further agreement as to wages. After B had worked 18 days he asked V to pay him $225 on account. Without asking B how long he had worked, and without any mutual understanding as to the wage rate to be applied, V gave B a check for $225 and B credited the payment on his time sheet as covering 18 days at $12.50 per day, without charge for board, etc. Completing the work the last of October, 1920, B worked in all 48¾ days. Shortly afterwards he went away on another job and wrote to V for an additional payment of $300, stating that he, B, was not sure what balance was due him, because he did not have his time sheet with him, but that he was sure there would be an additional payment due after receiving the $300. V remitted the $300, and in June, 1921, B sent him a bill for $84.38, covering the balance due, computed at $12.50 per day. V now refuses to settle, claiming that he bargained for a rate of $10 per day. B received $15 per day plus expenses for work done for other persons before and after doing this work, and worked 10 hours a day for V, as against 8 and 9 hours for his other employers. Because of the peak prices of 1920, B thinks that V ought to pay $12.50 per day. Do the circumstances stated show an agreement as to wages? Is there any action that B can take against V? What kind would be the most severe? Could a mechanic's lien be enforced, and who would pay the cost of same? Could B close V's business for a day or longer? Who would be obliged to stand the costs? —G. B., New York.

Right to Enforce Claim for Work Done

There is no room for doubt as to the law applying to this case. The main trouble in getting at the merits of B's claim is to ascertain the facts as to the mutual understanding between V, or what they should have understood when the work was actually commenced.

When V asked what B would charge for the work and B replied that he was getting $10 a day and expenses that amounted to an agreement that that was what would be charged. And we believe that, under the circumstances, B was bound to notify V that he wanted more money, if he was not willing to proceed at a rate of $10 a day and expenses after the work had been delayed several months. B's crediting the $225 payment as covering 18 days' work does not bind V unless V was notified of that fact and made no objection. We believe that if the $37.50 which B has been overpaid (on a basis of $10 per day) covers or substantially covers his actual and reasonably necessary expenses for board, carfare, etc., he had better drop his claim. But on the facts presented he is entitled to full payment of $10 per day, plus such expenses.

The time for filing a mechanic's lien has long passed, and there is no way whereby B can enforce closing of any part of V's business, excepting as he may first obtain judgment and have legal process issued under it against V's property. Should B get judgment he would get costs with it, but would have to arrange with his attorney for the payment of the latter's fee.

On the facts stated we advise against litigation.

In an interesting Texas case it appeared that a written contract for the construction of a cottage provided on its face that the owner should pay $990, but it was verbally understood that the real price should be $1,078. This arrangement was made because the owner's father, who was providing the necessary funds, had refused to pay more than $990. In denying the builder's right to recover the extra $88, the Texas Court of Civil Appeals said: "No one could rely upon written contracts if they could be contradicted and destroyed by the oral testimony of the parties thereto."

A Michigan contract for installation of a hot-water heating apparatus contained a clause in which the contractor warranted that the plant would warm rooms to a temperature of seventy degrees in zero weather, and nothing was specified in this written agreement concerning any improvements to be made by the owner to facilitate heating. It was therefore decided by the Michigan Supreme Court that the contractor could not etsablish a verbal qualification of the warranty by setting up a claimed understanding with the owner that the latter would build a stone foundation under the house.

An Illinois builder, who bound himself in writing to construct ornamental coping on a building, was denied the right to set up an oral understanding before the contract was signed that cornice molding might be substituted. And in a similar case the Illinois Supreme Court said: "If the specifications were attached to the contract at the time appellees executed it, then it matters not what previous understanding or arrangement existed; all prior or contemporaneous agreements were merged in the contract as executed."

Since the specifications covring construction of a house distinctly required the builder who constructed the brickwork to make a fireplace, the Massachusetts Supreme Judicial Court ruled that he could not show an oral understanding to the contrary. And the Kentucky Court of Appeals, applying the same principle in favor of a builder decided that he hav-



This Beautiful $2.00 PORTFOLIO of Wood Panels FREE to BUILDERS

This beautiful portfolio shows on various woods the many beautiful effects obtainable with Johnson's Perfectone Undercoat and Enamel, Johnson's Wood Dye, Johnson's Paste Wood Filler, Johnson's Prepared Wax, Johnson's Floor Varnish, Sani-Spar, Varnish Stain, etc.

Every portfolio costs two dollars, so we can't afford to send them out generally, but we are glad to furnish them gratis to contractors who use Johnson's Artistic Wood Finishes in their work.

The attached coupon will bring you the portfolio promptly, all charges prepaid. You will find it very convenient to show clients and prospects the effects you can give them with Johnson's Artistic Wood Finishes.

JOHNSON'S WOOD DYE

With Johnson's Wood Dye soft woods can be finished so that they are as beautiful as hard wood. Johnson's Wood Dye is very easy to apply—goes on easily and quickly without a lap or streak—penetrates deeply—brings out the beauty of the grain without raising it—dries in four hours—and does not rub off or smudge.

Three Johnson factories are operated under ideal working conditions—full force—full time—no reduction in wages—an eight hour day—ten days' vacation on full pay—full pay during sickness—liberal pension and bonus systems. This policy can be continued only if artisans will co-operate by insisting upon the JOHNSON brand.

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(Enclose your business card or letterhead)

ing constructed a house according to his written agreement, the owner could not rely on any verbal agreement that a stairway should be wide enough to admit the passage of a piano and a bookcase.

In another Massachusetts case, the Supreme Judicial Court adjudged that a builder could not demand extra compensation for furnishing certain ornamental balconies called for by the plans and specifications which were made a part of his written contract, by relying upon a claimed oral understanding that the contract price should not include the balconies. And a Missouri builder was denied recovery of interest on a deposit made to secure performance of his contract, because there was no written stipulation for interest, although he sought to show that there was a verbal understanding to that effect.

Where it appeared under a Connecticut contract that a building was to be constructed for a lump sum, the Supreme Court of Errors of that commonwealth held that the owner could not show an oral contract that the price should cover a verbal guaranty that the architect's plans would prove satisfactory to the owner.

A New York court has declared that a clause in a building contract against subletting of the work could not be contradicted by proving a verbal agreement to permit subletting. And the Louisiana Supreme Court has gone so far as to hold that items of extra work could not be shown to have been performed under verbal agreement, where the written contract provides against claims for extras not covered by written authority.

But, illustrating an exception to the general rule, to the effect that where a written provision is not specific, there may be proof of a mutual verbal understanding, the New York Supreme Court has ruled that where a building contract in wiring required the builder to furnish a "storm door with fancy embossed glass," the owner might prove a verbal agreement that the door should contain oval glass.

By analogy to the rule applying to verbal agreements offered to contradict written agreements, there is a similar principle which forbids proof of customs and usages in the building trade which tend to contradict special written contract provisions. So, the Michigan Supreme Court

How Is This Contractor to Collect His Pay?

BROWN'S property which he leases to the T. Company for ten years with the right to make improvements. After two years the company subleases to the H. & T. Company for eight years. V., president of the H. & T. Company, employs a contractor to make a twelve-foot addition to a building on the premises. On starting of the work V. directs that the addition be extended to 25 feet. V. explained to the contractor that he would finance the work personally, without drawing on the H. & T. Company. V. gave his personal notes for $1,000 to apply on account, and a total bill of $2,200, plus $400 extras, remains unpaid. In the meantime the T. Company has resumed possession, ejecting the H. & T. Company for non-payment of rent. Before such taking of repossession, however, the contractor filed a lien against the property in the name of V. V.'s notes have gone to protest.

"Who is the contractor to collect from? Is the T. Company liable?"—J. W. D., New York.

We are afraid that the contractor is "left holding the sack," excepting as he may be able to enforce personal judgment against V. We see no ground on which T. Company can be held. It is possible that lien might have been filed against the leasehold interest of the H. & T. Company on a theory that V. acted as its agent. But that recourse would have been avoided by the termination of the leasehold for non-payment of rent. Furthermore, the contractor appears to have looked wholly to V, as is indicated by his taking the notes from him and filing a lien in the name of V. We suggest that the contractor place his claims in the hands of some energetic attorney if there is any likelihood of V being good for judgment.

Wife's Acquiescence in Husband's Contract

WHEN an improvement is to be constructed on land owned by a married woman in her own right, or jointly with her husband, she should be induced to sign the contract under which the improvement is to be constructed. Too much faith should not be pinned to her husband's authority to contract on her behalf. Disregard of this suggestion may lead to annoying and expensive litigation should the wife attempt to evade personal liability or to ward off a mechanic's lien, to say nothing of the possibility of her succeeding in such a defense.

But those who have omitted to secure a wife's signature to a contract affecting her property will be interested to know that her acts may be taken as evidence of authorization or ratification of her husband's contract.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912.

Of Building Age and The Builders' Journal, published monthly at New York, N. Y., for April 1, 1922.

State of New York } ss.:
County of New York }

Before me, a Commissioner of Deeds, in and for the State and County aforesaid, personally appeared C. G. Peker, who, having been duly sworn according to law, deposes and says that he is the editor of the BUILDING AGE AND THE BUILDERS' JOURNAL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above ception, required by the act of August 24, 1921, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher—Building Age Publishing Corporation, 912-920 Broadway, New York City.
Editor—C. G. Peker, 912-920 Broadway, New York City.
Managing Editor—C. G. Peker, 912-920 Broadway, New York City.
Business Manager—David Meyers, 912-920 Broadway, New York City.

2. That the owners are:
Building Age Publishing Corporation, 912-920 Broadway, New York City.

That the stockholders owning or holding one per cent. or more of the total stock of Building Age Publishing Corporation are as follows:

B. A. & C. P. Holding Corporation, 1 Madison Avenue, New York City.

3. That the stockholders owning or holding one per cent. or more of the total stock of B. A. & C. P. Holding Corporation are as follows:

Frank Meyers, 912-920 Broadway, New York City; David Meyers, 912-920 Broadway, New York City; W. H. Parsons, 912-920 Broadway, New York City; W. A. Bardgett, 912-920 Broadway, New York City; M. & S. Meyers, 1 Madison Avenue, New York City; George Meyers, 1196 First Avenue, New York City; Michael Miller, 794 St. Nicholas Avenue, New York City; David L. Short, Columbia avenue and Hancock Street, Philadelphia, Pa.; G. Friedman, 627 Broadway, New York City; A. Cowen & Son, 34 West 25th Street, New York City; John J. Robbins, 276 Fifth Avenue, New York City.

4. That the known bondholders, mortgagees, and other security holders owning one per cent. or more of total amount of bonds, mortgages or other securities are:

Architectural and Building Press, 243 West 39th Street, New York City.

5. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as stated by him.

CHARLES G. PEKER, Editor.

Sworn to and subscribed before me this 21st day of March, 1922.

[Seal] SADYE BLUMENFELD, Commissioner of Deeds, New York City, No. 23028.

Certificate filed N. Y. County, No. 73.

WEAR and *rust-resistance* are qualities of first importance—particularly for sheet metal used for roofing and construction purposes. Keystone Copper Steel means better buildings. *It lasts.*

KEYSTONE
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The increased life of steel when alloyed with copper is a well established metallurgical fact. Time and weather tests have proved it to be best for both builder and owner.



Use Apollo-Keystone Galvanized. Shall we send new Weight Cards and Apollo Calendar?

For roofing, siding, gutters, spouting, eaves trough, sheet metal and tin work, use KEYSTONE quality Galvanized Sheets and Roofing Tin Plates. Sold by leading metal merchants. It assures satisfaction.



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News, Notes and Comment

Money for Building Operations

THAT new building operations throughout the country may reach record-breaking proportions for the year is indicated by the tremendous amount of capital now being absorbed by the building industries, and the unusual demand for additional funds to be used for these purposes. S. W. Straus & Co., who are possibly the nation's largest lenders of money for new buildings, announce that since the first of January they have underwritten first mortgage building loans of $43,980,000, and that from inquiries for additional building loans now being received there is every indication that the nation is on the threshold of an era of unprecedented building activity. With regard to the building situation, S. W. Straus & Co., say:

"We believe building activities will proceed on an ascending scale as the season progresses. There is a good demand for funds with which to carry on new building operations, and the general fundamental conditions in the situation are now so nearly normal that since January 1st, have underwritten building loans amounting to $43,980,000 of which $26,510,000 was for apartment houses, $12,350,000 for office and loft buildings and $5,120,000 for miscellaneous structures. If the demand continues at the same rate, and fundamental conditions seem to so indicate, we shall be in a position to loan approximately $100,000,000 more to finance new building construction during the balance of the present year.

"That the present encouraging conditions are nationwide in character is indicated by the widely scattered range of these financial underwritings which includes loans in fourteen cities and thirteen states as follows: New York, Chicago, Philadelphia, Boston, Atlanta, Detroit, Fort Worth, Cleveland, Birmingham, Dallas, San Francisco, Kansas City, Seattle, and Portland, Ore.

"It is to be noted that labor conditions in the building industries are better than have been observed for some time and that prices of materials have reached a condition of stability. The tendency in building material costs, in fact, is toward higher levels which may be expected to continue as building operations expand. There is also a growing appreciation of the fact that permanent improvement can best be brought about through the natural and normal channels that have built up our great American cities.

"The immense amount of new building operations now getting under way throughout the country will have a helpful effect on general business and the unemployment situation, so that the large construction gains now being accomplished will, we are sure, prove the forerunner of more prosperous times."

Book Notices

Perry Lumber Reckoner; a book of 106 pages; pocket size; published by Benjamin L. Jenks, Cleveland, Ohio. Price, $1.50.

Everyone in the building trade has had the need of finding out how many board feet in a certain number of pieces of a certain size and certain length. To do this with the ordinary rule for figuring board measure, would, of course, take a good deal of time, and that is where this book is a decided, practical help, as it gets right down to accurate examples and gives the answer.

In its 106 pages of condensed reading matter it contains an immense amount of useful information, tables and matter regarding different size timber. It renders answers to nearly every question that has to do with the figuring of lumber. It certainly will be a big help in estimating.

Its size, 3½ x 6¼, enables it to be carried in the pocket or in the pigeonhole of the desk.

* * *

Columns — A treatise on the strength and design of compression members, by E. H. Salmon; 279 pages; published by Oxford University Press, New York.

This is rather an exhaustive treatise on the strength of columns and other compression members. The book contains quite a good deal of excellent information for the advanced student of strength of materials. It contains a bibliography of the different books on the subject that have been published, which will be quite an aid. While very excellent, we believe that it would meet more with popular approval if some of the higher mathematics were eliminated. Unless one has a good working knowledge of calculus, besides geometry and trigonometry, the book would be of very little value.

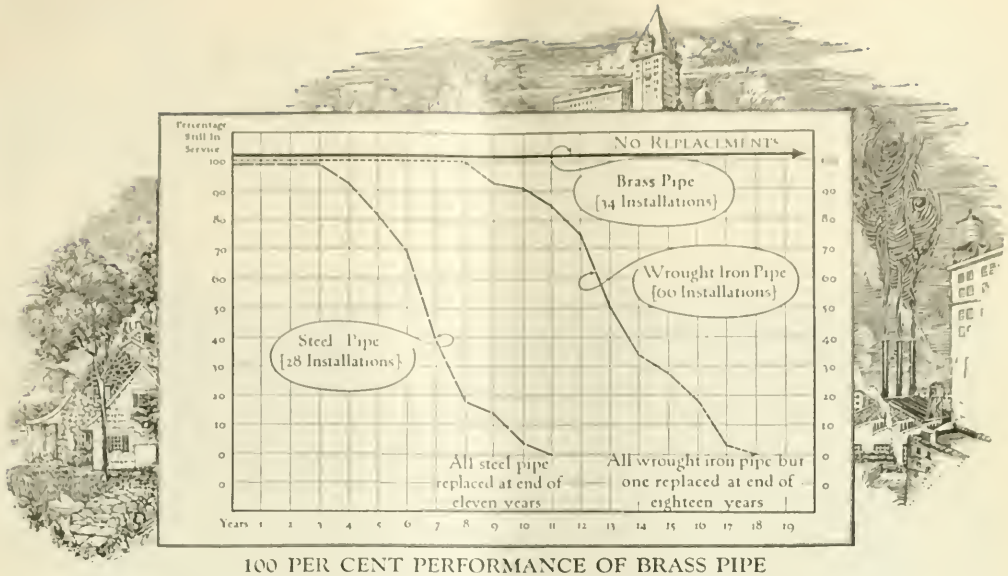
* * *

Success Through Vocational Guidance. By James McKinney and A. M. Simons. Published by the American School, Chicago, Ill. Price, $2.

Here is an interesting bok of 270 pages which contains some pertinent remarks on the choice of a life work. Its aim is to be a guide on how to choose wisely the line of business or profession best suited to one's abilities. An analysis can be made of one's own abilities, which will be a guide in this direction. The book contains some very interesting information and some really practical and helpful advice that will aid a young man in picking out a proper vocation.

Germs Pass Through Cistern Filters

CISTERN water that is used for drinking should be gathered with great care. Properly constructed cisterns that receive rain water from roofs generally afford good drinking water, but water of doubtful quality that is stored in cisterns is of course not safe for domestic use. According to the United States Geological Survey, Department of the Interior, most of the filters that are used in connection with cisterns do not remove the germs of disease, though they may make the water clear and apparently safe. Many cisterns are divided into two compartments by a brick wall, the water being admitted into one compartment and pumped or drawn from the other after it has passed through the wall. The passage of the water through the brick improves it in clearness and color but not generally in sanitary quality.



100 PER CENT PERFORMANCE OF BRASS PIPE

That was the significant result of a survey of hot water service in more than 100 apartment houses containing 1000 apartments

You Can't Argue with a Piece of Pipe

¶ When one of your men doesn't come up to your standard of good work, a little coaching produces the desired results.

¶ But you can't argue with a piece of pipe. All the persuasion in the world won't add a single hour to its allotted span of life.

¶ Pipe and pipe fittings represent only about 10 per cent of the cost of the plumbing installation, yet this relatively small item absolutely measures the useful life of the job.

¶ Brass pipe and pipe fittings—which, for hot water, add only about $\frac{1}{3}$ of 1 per cent. to the cost of a building and for both hot and cold water only $\frac{2}{3}$ of 1 per cent.—give a length of service far out of proportion to their cost. For Brass *permanently* resists rust.

¶ Good plumbing deserves good pipe. Brass is the thing.

Millions of people are now being told the facts about *the permanence of Brass* in the Saturday Evening Post and the Literary Digest. ¶ Many of these millions of readers of our advertisements are doing business with you. ¶ You can sell them Brass—and, by thus giving them a better job, keep their business, and get their friends' business, too.

"Brass is cheaper because you pay for it only ONCE."

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RESEARCH ASSOCIATION

25 Broadway, New York

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	March 28	April 29
LONG LEAF YELLOW PINE		
B. and Better Edge Grain Flooring, 2½" Face	$79.00	$74.50
Dimensions, S1S1E, No. 1 Common, 2x4", 10'	38.00	38.00
Timbers, Merchantable, '05, 12x12", 10 to 20'	49.50	51.50
B. and Better Ceiling, ½x3¼	42.50	41.50
B. and Better Finish, 1x4"	64.00	62.00
No. 1 Common Boards, 1x8"	38.00	43.00
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13/16x2½"	$67.00	$67.00
Roofers, 13/16x5½"	29.00	29.00
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3"	$79.00	$73.00
No. 1 Clear V. G. Flooring, 1x4"	76.00	71.00
No. 2 Clear and Better Ceiling, ½x4"	45.00	41.00
No. 2 Clear and Better Novelty Siding, 1x6"	54.00	50.00
No. 2 Clear and Better V. G. Stepping	90.12	86.00
Dimension, S1S1E, 2x4", 16'	40.00	36.00
Timbers, S1S1E, 12x12", 16'	54.00	50.00
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M	$7.40	$7.45
Washington Perfection Shingles, per M	7.18	7.18
Clear Bevel Siding, ½x6"	43.50	43.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½"	$8.75	$8.75
Dimension, 2x4", 10 to 16'	39.00	39.00
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2x2¼"	$159.50	$159.50
Clear Plain White Oak	115.00	115.00
Clear Maple, 13/16x2¼"	96.50	96.50
(All lumber prices furnished by National Lumber Merchant)		
COMMON BRICK—		
Per M. f. o. b. job	$19.50	$19.50
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered	$2.25	$2.40
STRUCTURAL STEEL (IRON AGE)—		
Per 100 lb. to large buyers	$1.83	$1.93
CRUSHED STONE (cu. yd.)—		
¾ in.	$2.75	$2.60
1½ in.	2.60	2.45
WALL BOARD—		
Per 1,000 sq. ft. in lots under 1,000 sq. ft.	$50.00	$50.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.	45.00	45.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered	$18.00	$17.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered	20.00	19.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	23.00	22.00
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag	$0.60	$0.60
Masons, per 50 lb. bag	.45	.45
SAND AND GRAVEL—		
Sand (per cubic yard)	$1.55	$1.50
¼ in. Gravel (per cubic yard)	2.80	2.70
1½ in. Gravel (per cubic yard)	2.80	2.70
FACE BRICK—		
Tapestry (delivered)	$45.00	$45.00
Caledonian (delivered)	40.50	40.00
Smooth Grey (delivered)	50.00	50.00
Fisk Lock f. o. b. factory	32.50	32.50
SHINGLES—		
Asphalt, Single (per square)	$8.50	$8.50
Asphalt, Strip (per square)	6.75	6.75
STAINED WOOD SHINGLES—		
16 in. Extra Clear (per square, delivered)	$10.50	$11.25
18 in. Eureka (per square, delivered)	10.60	11.50
18 in. Perfection (per square, delivered)	11.65	12.50
24 in. Royal (per square, delivered)	11.00	12.25
24 in. Imperial (per square, delivered)	11.70	13.00
VITRIFIED SEWER PIPE—		
4 in. (cents per foot)	$0.10½	$0.10½
6 in. (cents per foot)	.15½	.15¾
SLATE ROOFING—		
Bangor or Slatington, 8 x 16 in. (per sq. at quarry)	$8.40	$8.25
CORNER BEADS—(Galvanized)—		
Per Foot	$0.06	$0.03
WALL TIES—(Galvanized)—		
Per Thousand	$5.00	$5.00
FLUE LINING—		
8½ x 8½ in., Per Foot	$0.27½	$0.28
8½ x 13 in., Per Foot	.40	.40
HOLLOW TILE—		
8 x 12 x 12 in., heavy Each, delivered	$0.22	$0.23½
HAIR		
Per Bushel	$0.60	$0.60
PLASTER BOARD—		
32 x 36 x ⅜ in., Each	$0.23	$0.24
MAGNESITE STUCCO—		
Per Ton	$70.00	$70.00
TILE—		
1 in. Square or Hexagon, White, per sq. ft.	$0.30	$0.25
3 x 6 in. White Wall	.65	.60
8 x 8 in. Red Floor	.50	.45

CHICAGO PRICES

	March 28	April 29
YELLOW PINE—		
Boards, 1x8, No. 1 Com	$38.00	$38.00
Casing and Base, 6-8 in	64.00	64.00
Ceiling, ½x4, B. and Btr	43.00	43.00
Dimension No. 1, 2x4, 12 to 14 ft	31.00	31.00
Drop Siding, 1x6, B. and Btr	48.00	46.50
Finish, 1x4, B. and Btr	60.00	58.00
Flooring, B. and Btr. E. G., 1x3	70.00	70.00
Lath, 4 ft., No. 1	6.65	6.40
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	41.50	41.50
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear	$94.75	$94.75
Oak Flooring, ⅜x2, Cl. Pl., White	75.00	75.00
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear	$38.25	$39.25
Finish, S2S or S4S, 1x6 to 8 in. clear	81.50	84.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear	$38.75	$41.75
Shingles, Extra Clears, 16 in	4.60	4.65
COMMON BRICK—		
Per M. f. o. b. job	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$1.97	$1.97
STRUCTURAL STEEL—		
Per 100 lbs. to large buyers	$1.83	$1.93
CRUSHED STONE (cu. yd.)—		
¾ in.	$2.00	$2.00
1½ in.	2.00	2.00
WALL BOARD—		
Per 1,000 sq. ft. in lots 1 M to 2½ M	$45.00	$45.00
Per 1,000 sq. ft. in lots under M	50.00	50.00
SAND AND GRAVEL—		
Sand (per cubic yard)	$2.00	$2.00
¾ in. Gravel (per cubic yard)	2.00	2.00
1½ in. Gravel (per cubic yard)	2.00	2.00

ST. LOUIS PRICES

	March 28	April 29
YELLOW PINE—		
Boards, No. 1 Com., 1x4	$31.50	$31.50
Partition, ¾x3¼, B. and Btr	55.00	52.50
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	29.00	29.00
Finish, S2S, B. and Btr., 1x4, 6 & 8 ft	56.00	55.00
Flooring, B. and Btr., E. G., 1x3	70.25	67.25
Flooring, B. and Btr., F. G., 1x3	57.50	56.50
Lath, 4 ft., No. 1	6.05	6.00
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	35.00	38.00
CALIFORNIA REDWOOD—		
Finish, S2S, Cl., 1x6 in	$81.50	$84.50
Siding, 4 in. Bevel, 10 to 20 ft	38.25	39.25
8 inch Colonial	66.75	66.75
8 inch Bungalow	68.75	68.75
HARDWOODS—		
Oak Flooring, ¾x1½ and 2 in., Clear Qtr. White	$113.25	$111.50
Maple Flooring, 13/16x2¼ in., Clear	101.75	96.75
RED CEDAR—		
Siding, ½x6, Clear	$41.00	$41.00
Shingles, Clears, Per M	4.51	4.61
COMMON BRICK—		
Per M., f. o. b. job	$16.00	$16.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.10	$2.10
STRUCTURAL STEEL—		
Per 100 pounds to large buyers	$1.92	$2.02
CRUSHED STONE (cu. yd.)—		
¾ in.	$1.83	$1.83
1½ in.	1.83	1.83
WALL BOARD—		
Per 1,000 sq. ft. in lots under M	$50.00	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M	45.00	45.00
SAND AND GRAVEL—		
Sand (per cubic yard)	$1.10	$1.10
¾ in. Gravel (per cubic yard)	1.30	1.30
1½ in. Gravel (per cubic yard)	1.25	1.25

BUILDING AGE

AND

THE BUILDERS' JOURNAL

NEW YORK, JUNE, 1922



Southern Colonial Home Design

R. C. HUNTER & BRO., Architects

HERE tall columns lend dignity to this charming house design. The great two-story portico gives this house an unusual and imposing front of perfect symmetry. The columns are used to the best advantage, they are slender in proportion to their height, so as not to appear massive, they are well detailed and actually support a load as columns should.

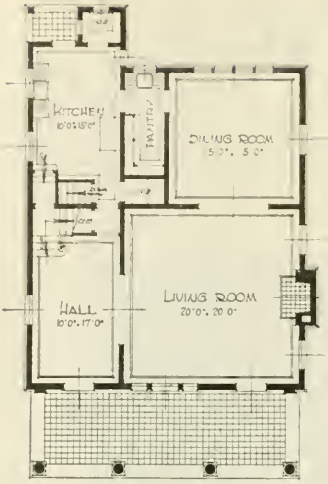
The circular window in the pediment fits the space as no other form would and the pane division lends variety and interest.

In the first story the central window forms the main feature and this is balanced by the entrance door on one side and the door to the living room on the opposite side.

The entire front is purely Colonial in detail and is worthy of study.

As one enters the house from the cool porch into a comfortable hall, the stairway at once attracts; of easy proportions, properly placed and well designed, it is a true Colonial stairway.

The living room is twenty feet square, it has a large open fireplace graced with pleasing mantel and it decorates admirably, as will be observed from the interior views.



FIRST FLOOR PLAN

The dining room has wood paneling done in a deep tone of ivory, while the bright colored Colonial paper above gives a cheerful contrast.

The plan arrangement of this house is as economical and practical as the exterior and interiors are artistic—a combination that approaches the ideal.

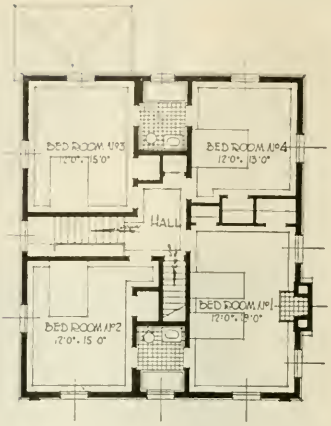
These things do not just happen; each and every detail has been worked out by the architects with great care.

Note how the stair arrangement eliminates the necessity of a service stair. The steps to the kitchen and the door on the landing give access to the second story without passing through main rooms.

The second floor plan is ideal. Four bed rooms, one in each corner, with cross ventilation and ample light. Two baths arranged so they serve the bed rooms privately, no passing through halls and past other rooms to reach the baths.

The bath tubs are tiled in on three sides, allowing showers to be installed with a curtain across the front of the tub. This takes the place of a separate shower stall.

The hall on the second floor is exactly in the center of the house (just where it should be), it provides wall space for the doors to the various rooms and linen closet and space for one chair at the head of the stairs, but that is all. The hall is not cramped, but there is not an inch of space that is not utilized to the utmost advantage.



SECOND FLOOR PLAN

This house is a good example of what can be done in the Colonial style without departing from a practical and economical plan.

This charming home was erected in Tenafly, New Jersey, for Mr. Walter H. Merritt from plans prepared by R. C. Hunter & Brother, Architects, of New York.



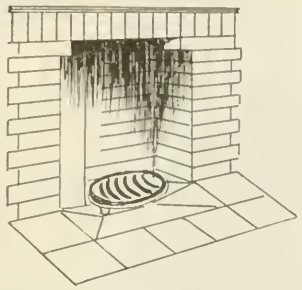
The Stairs Form an Interesting Feature of the Reception Hall



Dining Room
With Its Panelled
Wainscot Finished
in Ivory Enamel



Living Room,
Dignified and
Comfortable,
Fireplace a Feature



Design of Fireplaces

Modern English Design *of* Four Family House

Type of Houses Recently Erected by British Government

By JOHN Y. DUNLOP



THERE is, at the present time, a great demand for all classes of material for the building of the small house in England and very often the choice of material is very much a matter of cost.

At one time architects used only to use brick in brick-making districts, and where sandstone was to be found there were nothing but stone houses, and not only that, but in districts where granite was quarried the area surrounding those quarries would have no end of granite houses. Now this order has changed, with the result that if one local authority gets a cheap offer for brick houses there is no end to inquiries for this class of fabric. Of course, all this is helping to bring down the cost of building.

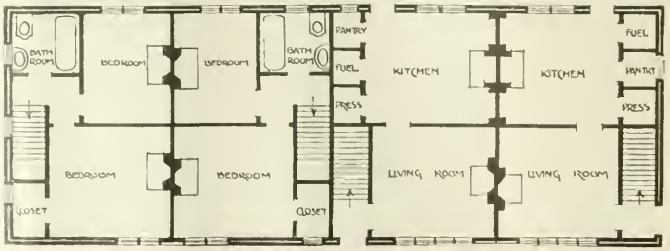
We are having a great number of brick and stucco houses erected all over England for the reason that in many districts there are large coal fields, with the result that much of the refuse in mining is being made into building brick. This class of material makes quite a good building brick, but it lacks the finished appearance of clay brick, and for that reason is mostly used in house construction where the outer skin is to be covered with Portland Cement stucco.

The house which is shown in the drawing is constructed partly in this way, while the lower story is built with an outer skin of pressed brick and an inner skin of common or blaze brick, as it is called in England. This house is built with hollow walls and at the junction of the stucco and the brickwork a moulded course is formed on the face of the wall. The advantage of this projecting course at this line is that it allows the lower outer skin of pressed brick to be built in the same line as the upper skin which is to receive the ornamental finish coat of stucco.

Without the moulding the top story wall would require to be kept back three-quarters of an inch to allow the stucco to finish flush with the pressed brick, which means that in carrying that out the top hollow space has to be curtailed or the upper wall has to be built three-quarters of an inch back from the face of the lower wall. The picture shows the pleasing effect of applying the stucco this way, the little projection giving a distinctive appearance that is decidedly pleasing.

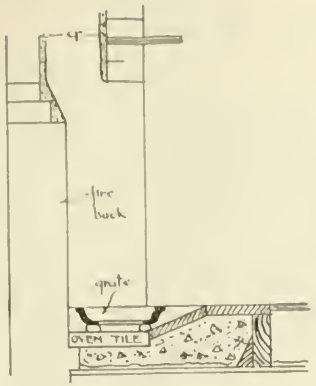
The skins of the hollow walls are bound together with galvanized iron ties.

The houses, which are arranged with four rooms each, contain all the



Second Floor Plans

First Floor Plans



Section of Fireplace

conveniences that are considered essential in England.

A sketch of the method of building the front gables is shown in which is indicated how the outer part of the wall is carried on the top of the window frame. The inner wall is built on the top of an angle iron beam which extends across from the brickwork on each side. This beam is also supported at the center by the partition which divides the two apartments and which is in line with the center of this gable.

To hide the edge of the party wall where it is built at this opening a concrete slab is formed in the inside of the middle window frame and in such a way as to allow the sash for this window to be made a fixture. The blank window is glazed with rough rolled plate in lattice panes to match the other windows.

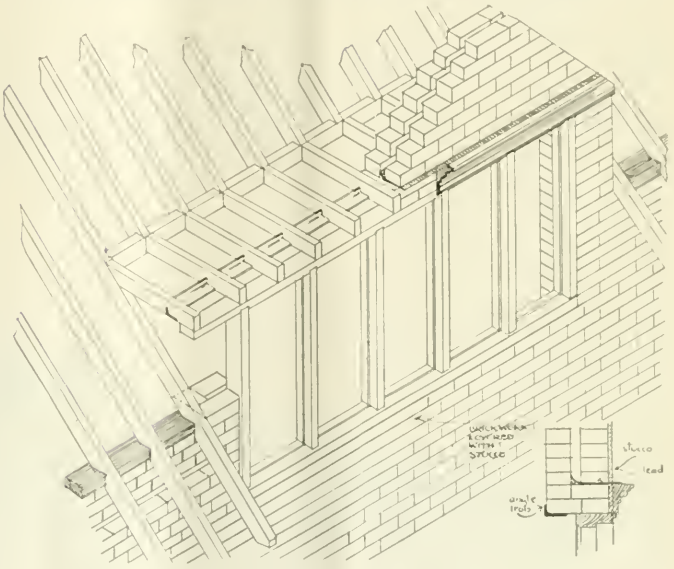
The stair from the small entrance hall is in one flight, which is not the best arrangement; still, with very small houses and where space is at a premium it is often the best that can be done.

The fitments in the kitchen were very complete and one thing which strikes one as being an arrangement worth copying was that all shelving was set up with a one-inch space between their back edge and the wall. This is most easily done by fixing up continuous vertical grounds 3 inches by 1 inch to which the shelf brackets are screwed. This 1 inch space prevents the accumulation of dust, improves air circulation, and permits the shelves to be cleaned without smearing the walls.

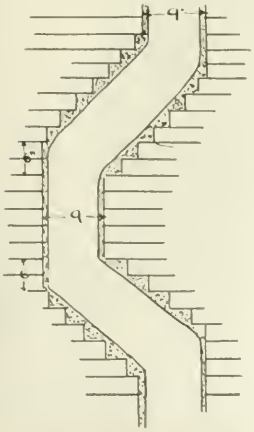
Each apartment in these houses has a coal fire from which a 9-inch by 9-inch flue is carried up to the stack. The back of the fireplace as shown in the section is brought forward near the middle of the flue. This stepping back should always be kept on since it must be taken into consideration that these flues will require to be swept at some time and it is by keeping those courses down that the flue will be the normal size at that point.

To insure a good draught each of these flues are built with one cripple, and to prevent the sloping parts from being contracted a two-course difference between the gathering points at the opposite sides of each bend was adopted.

The effective size of a small room is in this case much increased by the kerb or fender round the hearth being entirely dispensed with. The hearth at the outer tiles is set level with the floor, but the rear tiles sunk down a distance equal to the height of the grate bottom, an arrangement which is not only admirable for heating but achieves it with safety.



Detail of Dormer Framing Section



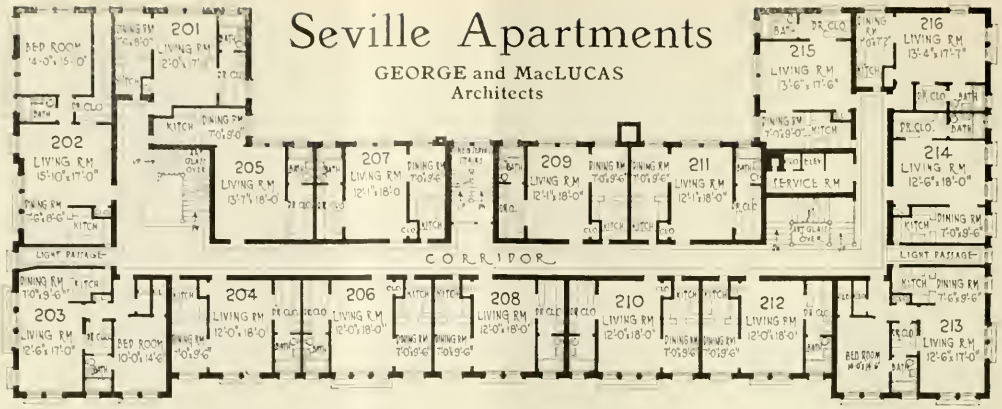
Section of Chimney Flue

FROM time to time we have published designs of "English" type houses and we therefore think that it will be of considerable interest to the readers of BUILDING AGE and THE BUILDERS' JOURNAL to show a photograph, plan and construction details of a real English dwelling of modern design. Each room is provided with an open fireplace for heating.

The layout of the rooms would hardly suit the requirements of the average American family, but it certainly is interesting to note what the people of other countries are building.—Editor.

Seville Apartments

GEORGE and MacLUCAS
Architects



MODERN apartments of small size are very popular with people who do not find it convenient to keep a large house, and quite a number of families who have a country house find it very desirable to keep a small apartment in the city, and it is to meet this demand that apartment houses like the one shown here are so deservedly popular.

The exterior of the building is of pleasing design along Spanish lines. It is built of light cream colored pressed brick with polychrome terra cotta ornaments, which give a decided artistic appearance to the structure; the whole appearance of the building being very striking and handsome.

There are sixteen apartments to each floor, or forty-eight in the whole building. All of the apartments are provided with in-a-door beds. The basement contains storage rooms and heating equipment.

The building, which is called "The Seville," was erected from plans drawn by George & MacLucas, and Fred M. Meiere was the general contractor. Freyn Bros. had charge of the plumbing, and the electrical work was installed by the Hatfield Electric Co.; all are of Indianapolis, Ind.



Uniting *the* Construction Industry

Progressive Aims of American Construction Council Now Being Formed

The Raising of Standards and Efficiency Its Object

By NOBLE FOSTER HOGGSON, of the Executive Board, Associated General Contractors of America and E. J RUSSELL of the Executive Committee, American Institute of Architects

FOR the first time in the history of American industrial development a great industry has united all its elements—manufacturers, labor, and the professional branches—in a great effort to raise the standards and efficiency of the industry and improve the service which it renders the public.

The nearest precedent is that furnished by the selection of Will H. Hays as arbiter of the motion picture industry, but the American Construction Council, on which the organization details are now being completed, goes much farther. It dips down into the industry and brings together for conference, for betterment of understanding and for common action the architects, the engineers, labor contractors, materials manufacturers and dealers, bankers and insurance men—all elements concerned with building work of any description and with the construction of public works, railroads, irrigation works, etc.

Organizing Meeting

It is stipulated that all the work of the Council must square with the public welfare and so dominant has this idea been in the preliminary conferences that Secretary of Commerce Hoover, seeing the benefits that will result, has taken the responsibility of presiding at the formal organizing meeting in Washington, D. C., June 19th and 20th, and Franklin D. Roosevelt, of New York, has agreed to accept the presidency. Every one interested is invited to attend. A descriptive pamphlet may be had by writing to 1053 Munsey Building, Washington, D. C.

The possibilities of the new organization are tremendous. If the reader were asked to tell what construction really is, the reply would probably be, "housing" or "plant construction and commercial building" or "highways and bridges, railroads and canals" or perhaps "terminals for railroads and ship traffic or irrigation and reclamation projects." Yet all of these are merely divisions or classifications of a single industry and should always be included in the thought of the whole.

Construction a Creator of Wealth

Instead of thinking of the building of houses as the individual expression of the fancy of the individual citizens, of the building of highways and railroads as merely the means of an industry we call transportation, of factory building and hydro-electric construction as isolated enterprises embarked in by isolated groups of individuals for private gain, we must think of construction as we do of agriculture, or of mining, or of manufacturing—as one of the great creators of permanent wealth, as one of the foundation stones in our civilization on which our progress is built.

Already indications of this are evident. Construction reports have become equal to crop reports as barometric indicators of the material prosperity of the country. On the their rise and fall depends the well being of millions of our people, the success of great enterprises, the future welfare of our citizens.

Construction a Basic Industry

The popular belief is that American industry is divided into four basic industries—(1) agriculture, (2) manufacture, (3) transportation and communication, (4) mining and forestry. Such a classification leaves out of consideration, however, what has been demonstrated after investigation to be the second most important industry in the country, namely construction. When considered from the standpoint of the yearly volume and money involved, this comes second only to agriculture and is among the first of all industries when expressed in terms of the labor.

Investigation has shown that the number of workers, who together with their families depend upon the construction industry for a livelihood totals approximately 11,000,000 persons. It was conservatively estimated that 24 per cent. of our annual capital accumulation and over 50 per cent. of our national savings are absorbed by this great industry every normal year.

Expenditures of Construction Workers

The support given to Agriculture and to Trade by the annual expenditures of this great number of persons is almost too apparent to need discussion.

Yet in this mighty industry each element has, with rare exceptions, acted by itself, looking after its own interest, neglectful generally of the rights of the other elements and, often indifferent to the rights of the public.

Lack of Popular Understanding

Since the war this lack of co-ordination, of actual understanding and of consideration of the service rendered the public has stood out more strongly than before. During the war it was necessary to postpone all but essential construction, leaving us at the close of 1919 with an enormous deferred volume of construction work. In 1920 we began to catch up, to fall back again in 1921; today we have a deferred total valued by students of the industry at $10,000,000,000. Of the housing shortage, an important part of this construction,

THE public demands that the industry square itself with the public interest by eliminating the minority that have brought it into ill-repute. The individual elements of the industry are aroused to the responsibility which it owes the public and to the opportunities for elimination both of duplicate association efforts and of wastes in construction operations.

the general public is well aware. Yet the shortage exists in every line of construction. We have not enough office buildings or schools, railroads or highways, while sewerage, water-supply systems and paving are far behind present needs.

The Housing Shortage

This shortage has put great pressure on every branch of the industry and has forced it to study anew its relationship to the whole. Moreover, the public has lacked confidence in the fairness of building costs and this has added to the pressure put upon the industry. Not only has each of the elements been re-examining its position and responsibility but efforts at co-ordinated work have been made.

Preliminary Work

The National Federation of Construction Industries, a war-born organization, was continued after the Armistice in an effort to pull the industry together nationally and has achieved some excellent results. The Building Congresses, with notable successes at New York, Seattle and Portland, Ore., attacked the problem locally.

The National Board for Jurisdictional Awards representing labor, contractors, architects, and engineers, and the Joint Conferences of Engineers, Architects and Contractors on Estimating and on Standard Contracts have each tackled specific problems common to the whole industry and demonstrated the need as well as the practicability of cooperation

Launching a National Movement

The way has thus been well prepared for the great national movement now launched. Nearly every one of the 250 national associations in the industry has tested out its own work and learned from experience the large amount of duplicate effort and its inability to grapple effectively with the problems that extend beyond its special field. They are ready and eager to have these common problems taken over by an all-embracing organization so that there may be the elimination of duplication and more resultful work. They appreciate that the public demand will no longer wait and that only through a broad, virile and effective movement, dedicated to the improvement of the service which construction renders the community, states and nation can the industry gain public confidence.

ONE million people are actively engaged working on field construction and another million people are engaged in manufacturing construction materials in the United States. Truly the Construction Industry is a Big Industry — second only to agriculture.

Saving by Co-Ordination

Through co-ordinated action there is opportunity for tremendous waste elimination, assuring to the public more and better homes, public buildings, railroads, bridges, etc., for their construction expenditure.

It is these tremendous possibilities, in dedication to the public service and elimination of waste, that have fired imaginations of Mr. Hoover and Mr. Roosevelt and induced them to accept positions of leadership in the movement.

A Code of Building Ethics

While the organizers have a large program of work mapped out, efforts will be concentrated at the start on a few of the more outstanding problems. Chief among these is the establishment of a code of ethics that will be universally accepted in the industry. Due to a small minority the whole business of construction is, as Mr. Hoover expressed it recently in addressing the industry, "under a great cloud and the moral ethics of the business are challenged daily throughout the entire country." Mr. Hoover added these significant words:

"I am convinced that these things can never be cured by legislation or by jails. They can be cured by the resolute action of the vast majority of honest men who form the professions, and it has now become vital in the country's interests that this should be undertaken."

Spirit of the Work

The organizers consider this message from Mr. Hoover a charter for their work. It is in this spirit that the ethical work will be undertaken in order that the industry may stand square with the public and that all practices inimical to the public welfare may be eliminated.

Statistics are much needed so that the industry may operate intelligently. While there are partial statistics collected by many sources, they have not been brought together and interpreted in the light of all the facts.

Apprentices for the Industry

Another great problem stands ready for effective handling. There is a shortage of building mechanics, and the labor organizations need help in establishing the necessary apprenticeship system. Mr. Hoover's department is making a national study of building codes, and when its work is completed there must be a nation-wide activity to carry the recommendation into effect—a type of activity which the new organization is designed to promote.

Publicity

In addition the program of immediate work embraces transportation, encouragement of local building shows, publicity directed at giving the public an adequate conception of the magnitude and work of the construction industry and studies of seasonal employment, with the initiation of efforts to level out the seasonal swings.

Voting Power

In its organization the cardinal feature of the Council lies in giving each group equal voting power. The ten groups agreed upon are: Architects, engineers, construction labor, general contractors, sub-contractors, materials and equipment manufacturers, materials and equipment dealers; bond, insurance and real estate interests; construction departments of public utilities, and the construction departments of federal, state and municipal governments.

Some of the associations engaged in the organization work have been the American Institute of Architects, the Federated American Engineering Societies, the Building Trades Department of the American Federation of Labor, the Associated General Contractors, the National Federation of Construction Industries, the National Association of Building Exchanges, the Building Trades Employers Association, the National Association of Real Estate Boards, besides a large number of associations of manufacturers.

Able Backing Assures Success

With this strong backing the organizers feel confident that the American Construction Council will quickly be able to play an important part in the industrial life of the nation. Work of great magnitude lies right at hand, crying for attention. The time is most propitious for action.



Interesting Stone Church Design

SELECTING a proper design for a church is not an easy matter for any congregation. They must always take in consideration future growth. Of course, where plenty of money is available quite an elaborate and handsome structure can be expected, but where there is a modest congregation, it is not expected that they will have a large structure.

The design shown here is that of the Larchmont Avenue Presbyterian Church located at Larchmont, New York. The principal part of this structure is of stone, laid on a concrete foundation.

It will be noted that some portions are of frame, covered with shingles, a considerable portion of the rear of the edifice is so constructed. This entire frame part together with the roof is considered temporary, as a completed stone structure is contemplated.

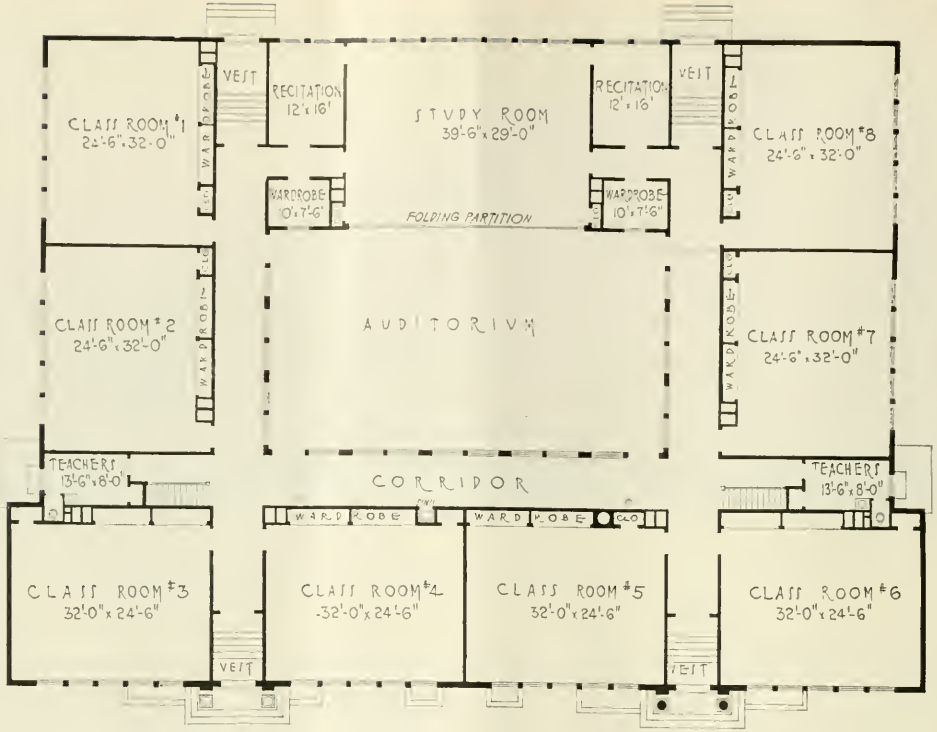
The two interior views show a simple but effective arrangement with quite a high ceiling. It will be noted that steps from the street level lead down to the church floor. The present church space will be occupied as a basement Sunday School room in the completed stone structure.

Too often we see a church that is started in this way, broken off with practically a flat temporary roof and it unfortunately remains as an eyesore in the community for a number of years. In this case, this feature has been very effectively taken care of and unless the design was studied carefully, one would think it a completed structure.

It is certainly a very interesting example of building craft. This church was designed by Messrs. Jallade, Lindsay & Warren, Architects, of New York.







Colonial Brick School Design

Public School Built at Yardley, Pa., from Plans Prepared by Heacock & Hokanson, Architects, of Philadelphia. The Builder was Chas. Y. Barlow of Trenton, N. J. Both Have Combined Their Energies in Making a Very Interesting Structure.



Public School Wardrobes

Some Practical Methods of Construction for Modern Schools

By E. J. G. PHILLIPS

THE older public schools were usually built with small rooms adjoining the class rooms, which served as wardrobes. The wardrobes may have fulfilled the purpose of providing a place for the scholars' wraps and caps, but they have also been the scene of, and have become memorable because of the mischievous pranks carried on within their walls in spite of the teacher's watchfulness.

The public school wardrobe of today has been pretty well standardized by the school boards of the larger cities and though varying in detail, the general ideas are similar. Instead of being built as a separate room, public school wardrobes of the most approved types are built in the end of the class room, with a continuous series of doors along the entire front, opening into the class room. Several methods of hanging the doors are in use, some of which clear the entire wardrobe when doors are open, and in others, stationary and sliding doors alternate so that about half the front of the wardrobe is clear when doors are opened.

A selection of the type best adapted to the particular case, may be made from the three sets of plans and elevations showing doors opened and closed, which are presented herewith.

A wardrobe with four sliding and four stationary doors, is shown in Fig. 1. This belongs to the type in which half the front of the wardrobe can be opened. Adjoining the childrens' wardrobe, to the left at "A" is the teachers closet or locker. At the opposite end of the wardrobe, the ventilator shaft has openings directly connected with the wardrobe on each floor of the building.

Accommodations for about forty-six pupils can be provided in a wardrobe about sixteen feet wide with coat hooks arranged in three rows as detailed. A hat shelf, preferably of woven wire is located just above the top row of hooks. Two feet is a convenient depth for this type of wardrobe.

The two doors sliding to the left are connected by continuous steel bars "C" and "D" shown more clearly in the section Fig. 2. The two doors sliding to the right are similarly connected. Each door is supported by a door hanger located on the top of the door at the center.

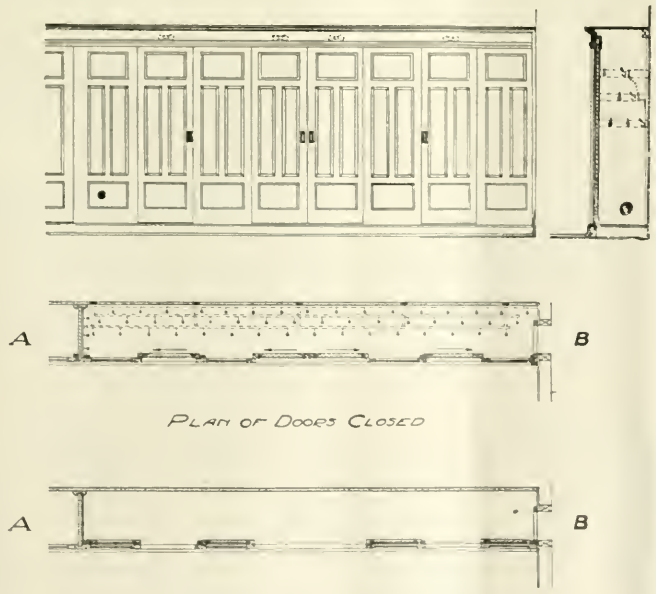


Fig. 1

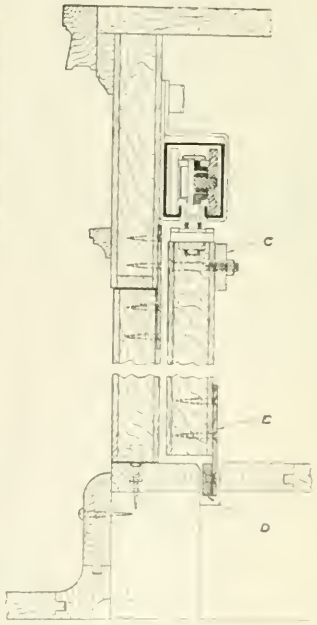


Fig. 2—Section of Door

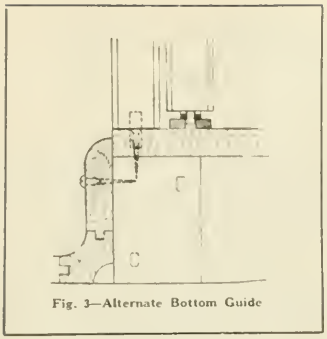


Fig. 3—Alternate Bottom Guide

The hangers are vertically adjustable so each door will be supported by the hanger rather than through the steel bars. The purpose of the bars is to keep the doors in line and to make it possible to operate several doors simultaneously.

By taking a position at the center of the wardrobe and moving one door to the right and one to the left, the teacher or monitor opens all of the movable doors. The bar "D" operates in a groove in the floor to guide the doors and keep the bottom in place. Plates "E" are as long as the doors are wide and serve to connect the doors with bar "D."

An alternate bottom guide is shown in Fig. 3, here two double roller guides are used in the bottom of each door.

A wardrobe with four doors sliding in the same direction behind stationary panels, is shown in Fig. 4. The capacity and details of construction is the same as the wardrobe shown in Fig. 1, except that in this case, the attendant moves all of the doors at once from a position in front of the teacher's locker "F." The fourth sliding door from the teacher's locker, stands in front of the ventilator shaft "G" when open. The method of hanging is shown in the sectional drawing Fig. 5.

In all wardrobes of the type just described, the doors should be made narrow, not exceeding two feet in width. Wider doors make it inconvenient to reach the clothing which is hung behind the stationary panels.

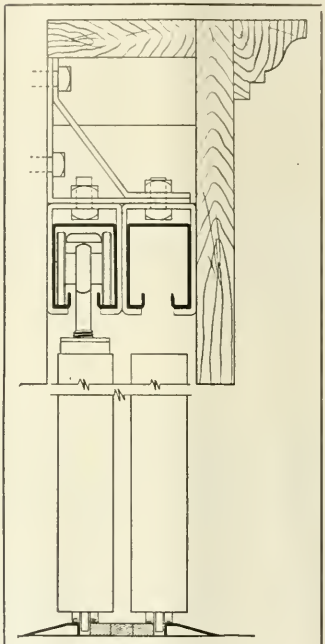


Fig. 7—Section with Double Track

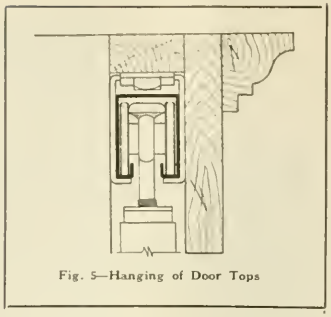


Fig. 5—Hanging of Door Tops

A different method of hanging the doors, by means of which the entire wardrobe is thrown open, is shown in Fig. 6. In this case only four doors are required, but their width is increased to about four feet.

A set of parallel door hanger tracks extend across the whole wardrobe as indicated in the plan. Each door is mounted on a pair of hangers and is usually operated independently, although the two doors which slide in the same direction, could be made to operate together if considered essential.

The vertical section Fig. 7 shows the method of hanging the track and also details the floor guides used at the bottom of the doors. The tracks are cased up in such a way as to be removable.

The upper panels of the doors used in plan Fig. 6 are frequently finished for use as blackboards, while the lower panels are of woven wire for ventilation purposes.

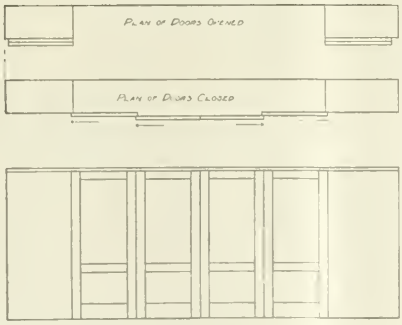


Fig. 6

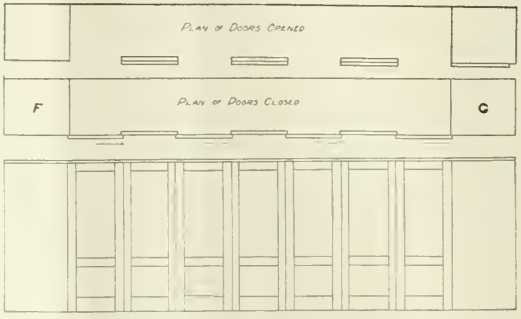


Fig. 4



Bungalow with Basement Garage

VORSE, KRAETSCH & KRAETSCH, Architects

HERE is a very interesting example of a bungalow erected on a slightly sloping site. In this way, a driveway to the basement was conveniently made so that the garage could be placed directly underneath one portion of the house as will be noticed. Access to this garage is had from the interior by a convenient hall in the basement.

This house was built for Mr. Carl Weitz at Des Moines, Iowa, and is an interesting example of brick and stucco work.

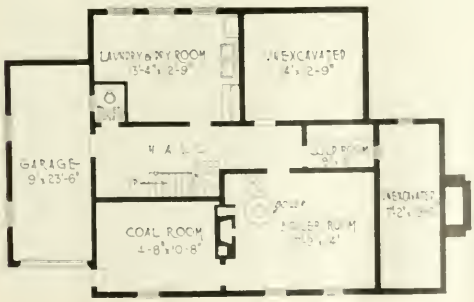
For floors and ceilings over garages the best and most reliable construction is of course, reinforced concrete or some other type of incombustible fire-resistive floor. Where this is not used, the following is recommended:

Two-inch floor joists spaced on not less than 16-inch centers and properly bridged. Overhead flooring double, of 7/8-inch rough and finished floor boards with a layer of asbestos floor felt between. Ceiling of heavy metal lath and Portland cement or gypsum plaster not less than 3/4-inch thick. The metal lath to be attached to the joists by sixpenny nails driven nearly hole and heads turned over against the lath, also by strands of No. 8 annealed wire looped over each third joist engaging the lath at bottom of joist and twisted snugly to place. These loops to be spaced at intervals of 2 feet along the joists. The lath to be bent down 6 inches along the walls on all sides and securely attached to same.

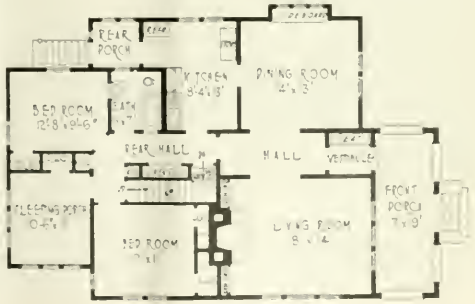
For walls and partitions suitable construction can be had by using brick, hollow tile, concrete block or gypsum block 4 inches thick, or reinforced concrete 3 inches thick.

With frame construction, the walls should be of back-plastered Portland cement stucco on metal lath attached to wooden studs spaced on 16-inch centers with metal lath and 3/4-inch Portland cement or gypsum plaster on the inside surface.

Wire glass should be used in all windows and a solid metal covered door used between garage and hall.



Basement Plan



First Floor Plan

BUILDING A NEW TOWN

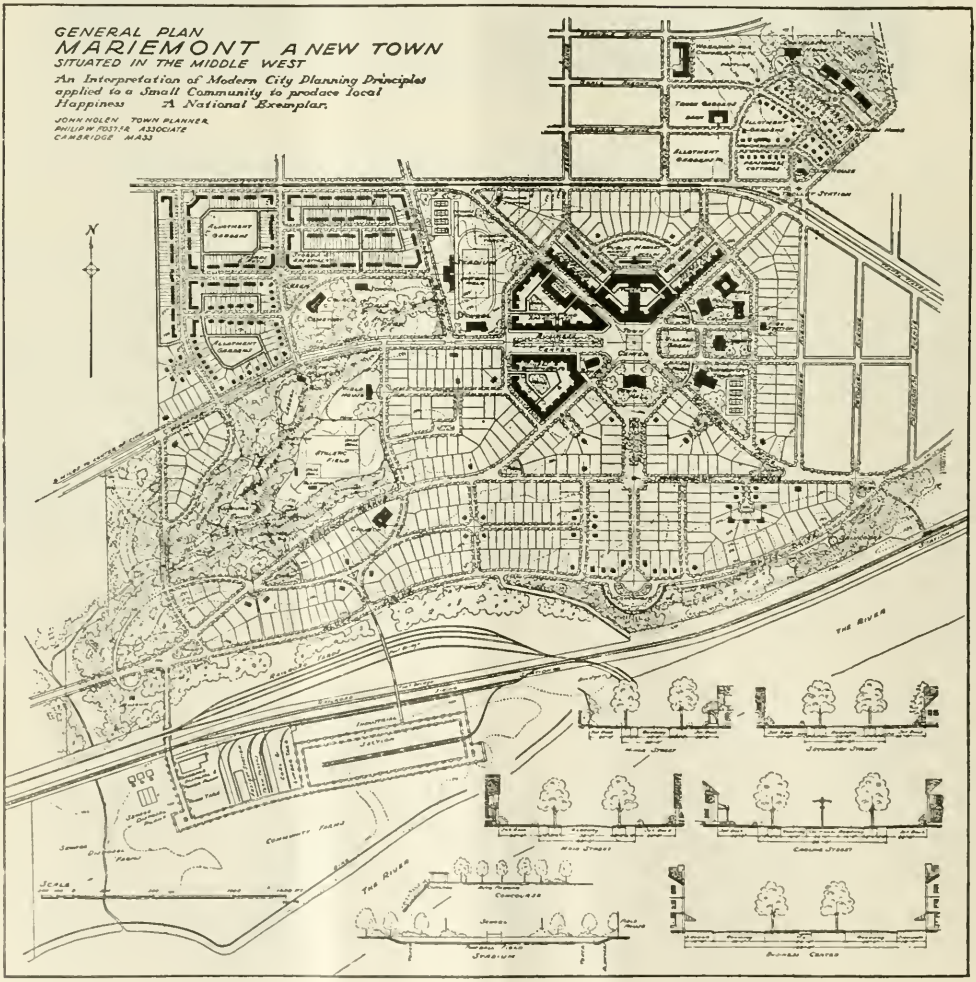
HERE is a plan for a new city to be developed as a suburb of Cincinnati. It is now a piece of farming land with certain natural advantages that make it an ideal location for such a project.

This undertaking is a philanthropic work of Mrs. Mary M. Emery, a wealthy resident of Cincinnati who desires to see good accommodations for wage owners in a model town.

Mariemont is named after Mrs. Emery and it will follow in general the plan of the English Garden City of Letchworth. It will however be put on a substantial business basis in accordance with American ideas. It is not a charitable scheme but a proposal that is intended as an example that it is hoped will be repeated in many places of the United States.

The Mariemont general plan as laid out, covers a tract of about 365 acres, it provides for a town with its village green and public buildings, stores, library, hospital, theatre, school sites, playgrounds and parks, and complete and attractive housing accommodations

Adequate provision will be made for the proper maintenance of the property as a complete town or suburb. Mariemont is being developed under the direction of John Nolen, Town Planner of Cambridge, Mass.



Modern Bank

IN the construction of banks nowadays more consideration is given to interior fittings, marble, hardwood and bronze being used in even the smallest banks. A handsome interior is as much of an asset to the bank as is a handsome exterior design.

The interesting design shown on this page is that of the State Bank of Belmond, Iowa, which was planned and erected by the Moorman Co. It is certainly a creditable example of bank architecture.

The erection of a dignified bank structure is usually followed by the erection of other commercial structures in its vicinity and the entire town benefits by such a progressive movement.





Bank Interiors of Marble, Bronze and Hardwood Are Dignified and Impressive.



Modern Commercial Building

AYMAR EMBURY II. Architect

ONE hardly associates a tobacco warehouse with any idea of architectural beauty, but here is an interesting example of how a commercial building can have architectural merit.

This building is the office and warehouse of Collman Bros., tobacco dealers, located on Front Street, New York.

This is an interesting example of a modern office and warehouse building. Its architecture is strictly Colonial, both as to its exterior and interior.

There is no reason why our commercial buildings cannot be beautiful instead of ugly in their design and Mr. Embury has shown here what can be accomplished by careful planning.

The office interior is of special interest. It is finished in white and mahogany, and is a fine example of interior woodworking and ornamental plastering. The owners believe that men will do their best work in pleasant surroundings, and they certainly have provided them in this building.





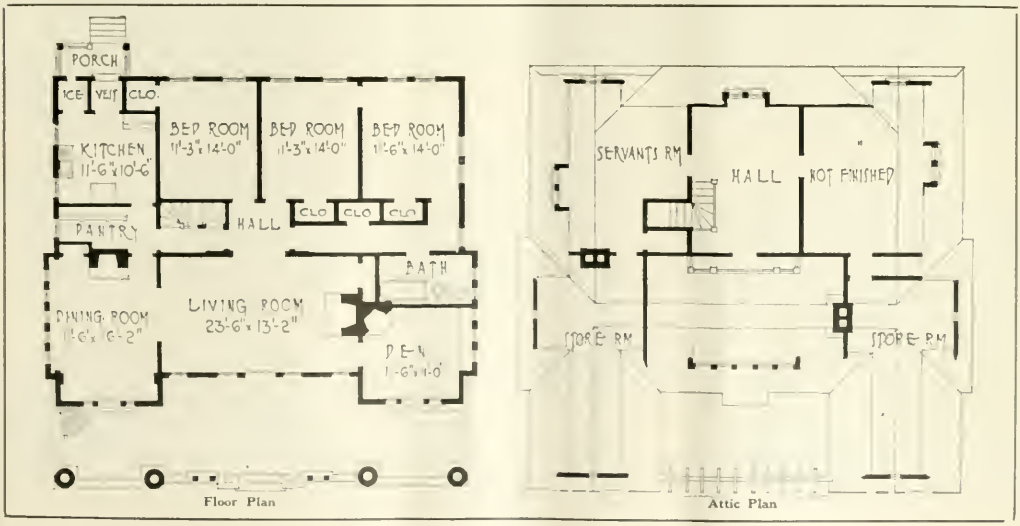
Stucco Bungalow Design

FOLSOM and STANTON, Architects

CHARMING indeed is the bungalow design shown on this page. It was built at Merchantville, N. J., for Mr. John Rowe from plans prepared by Folsom & Stanton, architects, of Philadelphia, and was built by the William A. Evans Co. some few years ago.

The building is of frame with stuccoed exterior, and a very interesting feature is the porch arrangement; here two gable ends form covered porches. The center porch is an open terrace with a pergola arch over the steps. This forms, as our picture shows, a very charming entrance when the June roses are in bloom.

From the terrace and porch one can enter either the dining room, living room or den. The living room is quite large in size, and its height extends up to the ridge; the large open fireplace has its chimney inside of the living room, and this forms a very interesting feature. A front dormer window leads up to the top part of the living room and affords excellent ventilation. A balcony on the opposite side is another very striking feature of this unique living room.





Special Plumbing and Lighting Requirements for the Modern Garage

By CHARLES L. HUBBARD, M. E.

WHILE in a general way the plumbing requirements are the same in a garage as in any other industrial building, there are certain conditions which require special treatment, among which may be mentioned washing and thawing devices, water heating and pressure tanks when city pressure is not available, and traps in connection with the floor drains for preventing gasoline from reaching the sewer.

Washing Equipment

In case of a small private garage, the washing of cars is usually done outside by means of a hose attached to the house sill cock, supplemented by warm water from the laundry heater in cold weather. When there are several cars to be cared for, which are also in use throughout the winter, special equipment should be provided for washing inside the garage.

The first necessity for this purpose is a "washing stand," which is a cement floor space, somewhat larger than a car, sloping gradually to a drain at the center. Next is an ample supply of warm water which may either be drawn into a pail or thrown from a hose under slight pressure.

Water may be heated in the same form of tank as for laundry work, and is best supplied with a steam coil connected with the heating system. If hot water is used for warming the building, an arrangement may be made for circulating hot water through the coil in the storage tank. In general, best results are to be obtained by bringing hot and cold water pipes to a mixing valve, with which a hose and nozzle are connected, as in this way any temperature desired is easily obtained.

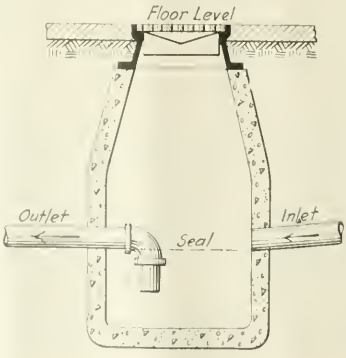


Fig. 4—Form of gasoline trap

A convenient hose arrangement for washing is shown in Fig. 1, consisting of a swivel connection at the ceiling to which a hose is attached, as indicated.

A typical water supply layout for a case where city pressure is not available is illustrated in Fig. 2, in which a pneumatic pressure tank B, and force pump driven by a gasoline engine are used. Hot water is furnished by tank A which contains a brass coil supplied with steam from the heating boiler.

Both hot and cold water are piped to a mixing valve on the main floor of the garage, from which connection is made with a swivel hose of the type shown in Fig. 1. These sketches are given as suggestions and may be modified or combined so as to adapt them to different conditions.

Although ice is commonly removed from a car by drenching with warm water, it is often convenient in a large city garage to have some means of doing this more rapidly and with less labor.

A convenient arrangement for doing this is shown in Fig. 3, and consists of a concrete pit, along the sides of which are steam pipes. The car is run over this for a short time until the ice is melted.

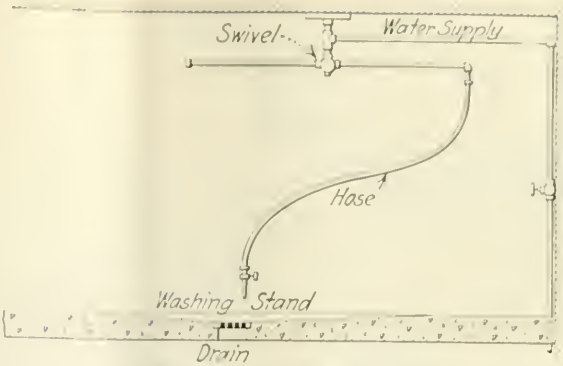


Fig. 1—Convenient hose arrangement for washing

Drainage

In arranging for the floor drainage of a garage particular care must be taken to prevent any gasoline from reaching the sewer, otherwise an explosive gas is likely to be formed which may find its way into the drains from other buildings and so cause serious damage under the right conditions. This may be prevented by the use of a special trap which seals the drain against the passage of gasoline.

A form which may be constructed upon the premises consisting of concrete, with a manhole frame and grating, is shown in Fig. 4. All of the floor drains from the garage should be brought into this, and the gasoline, being lighter than water, will float upon the surface and thus be evaporated while the water is drawn out from a point well below the surface. The size of the catch basin will vary in different localities, some cities requiring one of considerable size, say from 3 to 4 feet in diameter, and about 4 feet in depth, while in other cases one considerably smaller is acceptable. In the arrangement shown, the gasoline vapor passes back into the room through the grating and must be cared for by some of the methods of exhaust ventilation previously mentioned.

In some cases a vent pipe is carried from a point somewhat below the grating, with the idea that air will pass downward into the chamber through the grating, forcing the gasoline vapor out through the vent pipe.

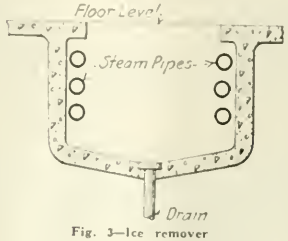


Fig. 3—Ice remover

As the vapor is heavier than air, the advantage of this seems somewhat doubtful, but it can at least do no harm.

Storage of Gasoline

This is usually taken care of at the present time by the various oil companies, who install the proper storage and pumping equipment.

Tanks and pumps are usually placed out of doors both for safety and convenience. If, for any reason, it is necessary in a city to place them inside, the storage tanks should be buried in some cool part of the basement remote from boilers and steam pipes and provided with filling and vent pipes carried outside.

All work of this kind is subject to rules of the building departments and insurance companies and special data should be secured from them in any given locality before the work of installation is begun. In any case gasoline should never be stored above the floor level of a building, nor should the tanks ever be subjected to air pressure for purposes of raising them to a higher level, as with these arrangements there is always danger of flooding in case of carelessness or leaky valves. Hand pumps, especially designed for this purpose, form the only safe means of handling gasoline about the garage.

Lighting

It is evident from what has been said regarding the danger of gasoline vapor, that an electric bulb is the only safe means of lighting a garage, and this is usually available in the case of all buildings of any size.

For the small private garage in the country, all repair work should be done in the daytime and a flashlight or electric torch of good size be used around the car at night. A small automatic electric plant for lighting both the house and garage is one of the best arrangements for cases of this kind where it can be afforded.

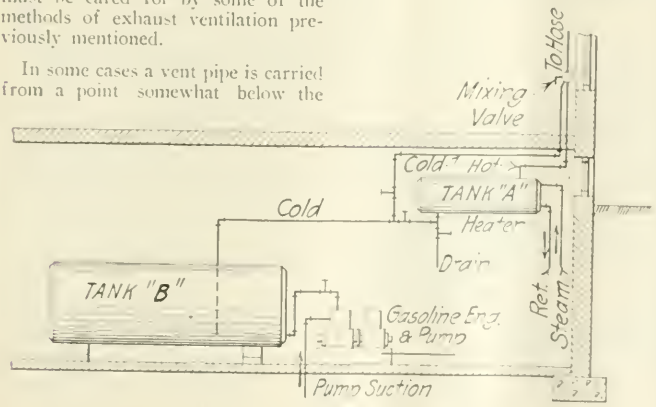


Fig. 2—Typical water supply arrangement

Attractive Seven Room Home

Specially Designed for Readers of Building Age and The Builders' Journal

By R. C. HUNTER & BRO., Architects, New York

THE plans of this house show that it is modest in size. The first floor rooms are no larger than are required for their various uses, compatible with comfortable living; in fact, floor space has been reduced to effect economy, so that every foot of space is utilized, yet nothing is cramped or uncomfortable.

The architects have reduced the first floor area to a minimum; what happens to the second floor? The layout here is not disappointing; we find four bed rooms, a bath and ample closet space, the result of very careful planning.

To get four bedrooms of good size over a small first floor makes an economical house since it provides room for the family and guests without the expense and burden of a large house.

As to the servants; a little thought on the stair arrangement, windows in either end of the house and a dormer on the rear; these give two good rooms and a bath on the third floor in what would otherwise be waste attic space. There are no dormers on the front of the house to mar the architectural appearance of the exterior.

The perspective sketch shows an exterior of refined simplicity. The latticed entrance porch bids one a hearty welcome, while the triple window over the entrance relieves the front of any trace of monotony and gives excellent light in the center bed room.

A study of the plans at once shows that consideration has been given to the furnishing of the house. This is an important item for, often we find a large bed room with no place for the bed, owing to the entrance door having been improperly placed or a closet located in the wrong corner of the room. Or, again, we find a dining room where no provision has been made for the sideboard.

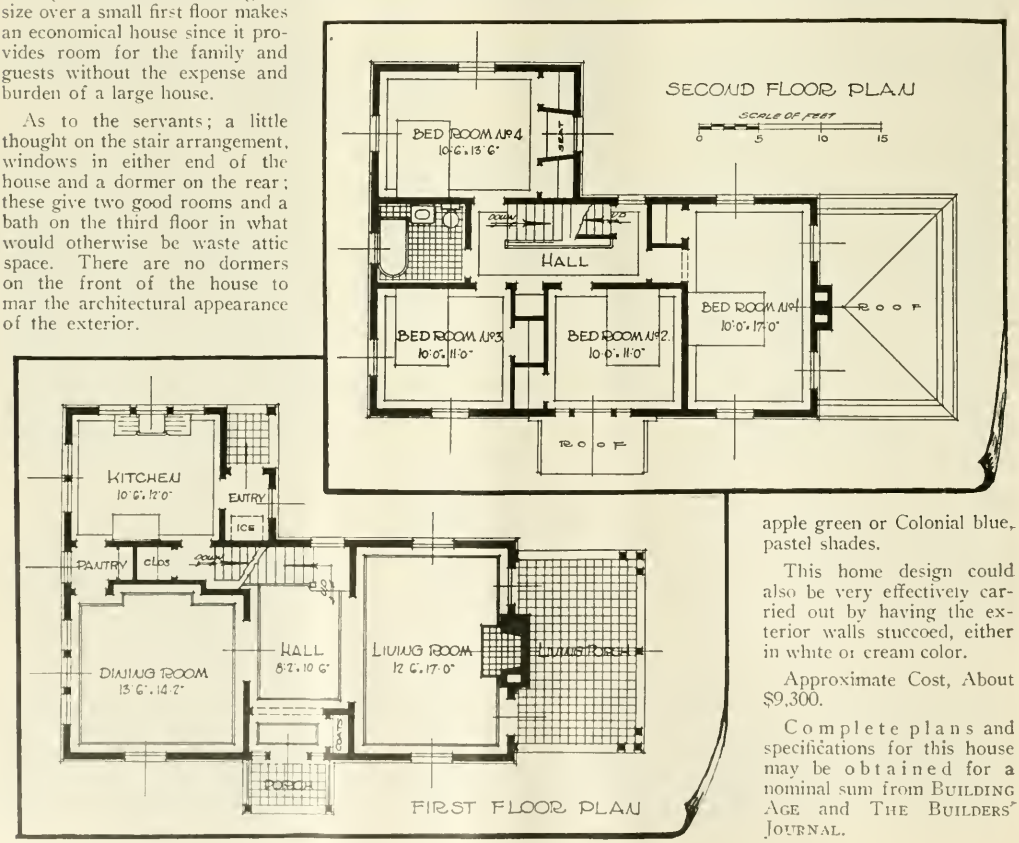
The time to overcome these defects is when the plans are drawn. An ounce of prevention is worth a pound of cure. Of what use is a room if it cannot be properly furnished? It certainly is not comfortable to live in.

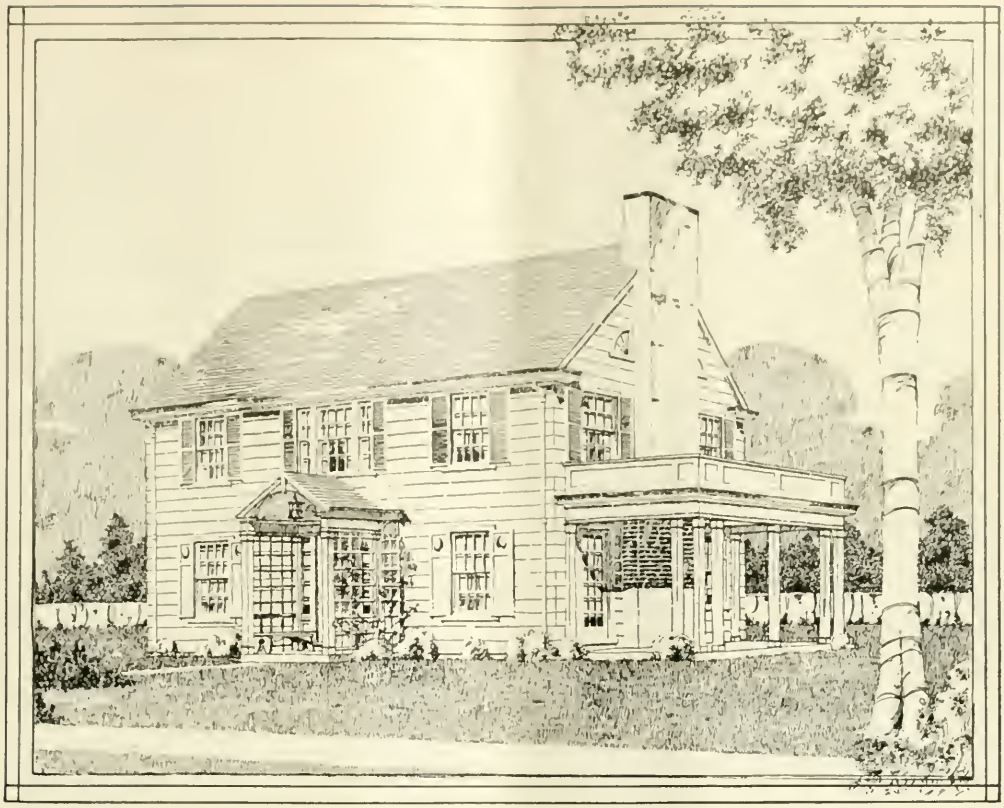
This house is of frame construction, it has been designed for white shingles on the walls and a shingle roof stained dark. Shutters and blinds should be finished in either apple green or Colonial blue, pastel shades.

This home design could also be very effectively carried out by having the exterior walls stuccoed, either in white or cream color.

Approximate Cost, About $9,300.

Complete plans and specifications for this house may be obtained for a nominal sum from BUILDING AGE and THE BUILDERS' JOURNAL.





Quantity Survey *of* Attractive Seven Room Home

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc. Minor outs have been disregarded.

Such items as clearing site, temporary work and protection, scaffolding and general equipment and supplies, have not been included.

Such items as are marked "Unit," are to be estimated in a lump sum, following requirements of plans and specifications

EXCAVATION

(Excavation for pipe trenches not included)

Excavation for cellar	254 cu. yds
Excavation for footings	17 cu. yds
Excavation for areas	15 cu. yds.
Excavation for trench walls	13 cu. yds
Excavation for leader drains and dry wells	16 cu. yds
Backfilling around walls, etc	43 cu. yds
Leader drains and dry wells:	
Field stone for dry wells	14 cu. yds.
4" salt glazed tile drain pipe	48 lin. ft
4" elbows	8

MASONRY

Concrete work:	
Concrete for cellar walls	920 cu. ft
Concrete for footings	284 cu. ft.
Concrete for trench walls	175 cu. ft.
Concrete for area walls	211 cu. ft.
Cellar floor (3" concrete and 1" cement finish)	720 sq. ft.
Outside cellar steps (concrete cem. faced)	40 sq. ft.
Area bottoms (brick and sand)	32 sq. ft.
Porch floors (12" cinders, 3" conc. and 1" cement finish, colored and blocked off)	174 sq. ft.
Concrete forms	2300 sq. ft
Pointing cellar window sills	18 lin. ft

BRICK WORK

Common brick work for chimney (2.8M)	140 cu. ft.
Face brick for hearth and jambs (or 105 brick)	15 sq. ft
Fire brick for fireplace (or 75 brick)	15 sq. ft
Face brick for porch borders (or 250 brick)	50 lin. ft.
8" x 12" T. C. flue lining	62 lin. ft
3" bluestone chimney cap (2'0" x 3'8")	1 Unit.

MASON'S IRON WORK

Fireplace damper (3'0" opg., with throat, etc.)	1	Unit
C. I. ash dump	1	Unit
C. I. cleanout door for ash pit (16"x12")	1	Unit
C. I. cleanout door for boiler flue (8"x8")	1	Unit
Thimble for boiler flue (9" dia.)	1	Unit

PLASTERING

Three coat patent plaster on wood lath, Gross (Net 660 sq. yds.)	815	sq. yds.
Keene's cement plaster on metal lath (servant's bath) Net	14	sq. yds.
Run cap	26	lin. ft.
G. I. corner beads	90	lin. ft.

TILE WORK

Tile work for bathrooms:		
Floor (1" hex. white)	36	sq. ft.
Wainscot (3"x6" white wall tile)	92	sq. ft.
6" sanitary base	18	lin. ft.
Moulded cap	24	lin. ft.

SHEET METAL WORK

Tin roof on living porch	198	sq. ft.
Tin flashing for roofs, etc.	64	lin. ft.
Tin flashing for column caps	12	caps
Tin flashing and counterflashing for chimney	8	lin. ft.
Tin gutter lining (20" wide)	95	lin. ft.
Tin valley lining (20" wide)	38	lin. ft.
4" half round hanging gutter (No. 24 gauge galv. iron)	6	lin. ft.
3" half round hanging gutter	10	lin. ft.
3" tin leaders	81	lin. ft.
2" tin leaders	20	lin. ft.
Bends for same	18	
Gutter thimbles	9	
3"x4" G. I. gas range vent	22	lin. ft.
Cap and thimble for same	1	

CARPENTRY

Timber: All No. 1 common stock, hemlock, rough unless noted.		
Cellar girders, 6"x10" spc. 1/18, 1/14, 1/12	220	F.B.M.
2"x3" nailer—84 lin ft	42	F.B.M.
Sills—4"x6" 1/18, 4/14, 5/12, 1 10	288	F.B.M.
Posts—4"x6" 5/18, 2/10	220	F.B.M.
Studs, girts and plates, 1st floor: 2"x4"—125/10, 73/8	1224	F.B.M.
Studs, etc., 2nd floor: 2"x4"—131/10, 119/8	1409	F.B.M.
Studs, etc., 3rd floor: 2"x4"—51/12, 25/10	575	F.B.M.
1st floor joists: 2"x10"—21/16, 15/14, 11/12	1131	F.B.M.
2nd floor joists: 2"x10"—12/16, 28/14, 13/12	1233	F.B.M.
3rd floor joists: 2"x8"—10/16, 44/12	964	F.B.M.
3rd floor ceiling beams: 2"x4"—29/10	194	F.B.M.
Rafters: 2"x6"—37/14, 18/12	733	F.B.M.
Valleys: 3"x8"—2/18	72	F.B.M.
Ridge: 2"x8"—2/14, 3/10	78	F.B.M.
Living porch rafters: 2"x6"—10 10—2"x8"—2/14	121	F.B.M.
Living porch ceiling beams: 2"x4"—13/10	87	F.B.M.
Plates: 4"x10"—1/16, 2 10	120	F.B.M.
Col. cores: 3"x4"—8/10	80	F.B.M.

CARPENTRY (Continued)

Entrance porch rafters: 2"x6"—5/10	50	F.B.M.
Ceiling beams: 2"x6" (cut to radius)—5 8	40	F.B.M.
Plates: 3"x8"—1/10	20	F.B.M.
Floor Bridging: 2"x2"—350 lin. ft.	117	F.B.M.
Cornice outlookers: 2"x2"—150 lin. ft.	50	F.B.M.
Cellar partitions (studs): 2"x4"—13/14	122	F.B.M.
Sheathing (7/8"x8" shiplap) no outs:		
Walls—to cover	2600	sq. ft.
Flat roofs—to cover	198	sq. ft.
Sheathing (waterproof)	2600	sq. ft.
Shingle lath—7/8"x3"	2950	lin. ft.
Grounds: 3/4"x2" surfaced one side	2000	lin. ft.
Sheathing for cellar partitions: 7/8"x8" shiplap—to cover	200	sq. ft.
Rough flooring (7/8"x8"shiplap): 1st and 2nd floors—to cover	1500	sq. ft.
Furring (7/8"x2")	200	lin. ft.
Shingle roofs (18" stained shingles): 13.2 squares	9100	shingles
Shingle sides (24" stained): 19.2 squares	6350	shingles

Exterior Finish

Watertable (7/8"x2" strip)	136	lin. ft.
Main cornice:		
7/8"x8" soffit	91	lin. ft.
7/8"x4" fascia	91	lin. ft.
7/8"x6" frieze	84	lin. ft.
5" crown mould	91	lin. ft.
3" bed mould	84	lin. ft.
Raking cornice: 5" mould	91	lin. ft.
Dormer cornice:		
7/8"x4" fascia	10	lin. ft.
7/8"x4" soffit	10	lin. ft.
5" crown mould	10	lin. ft.
2" bed mould	10	lin. ft.
Cellar Bulkhead:		
7/8"x3 1/4" M. & B. ceiling	54	sq. ft.
5/8"x7/8" cove	16	lin. ft.
Porch finish:		
Entrance porch:		
6"x6" box cols—7'8" long with cap and base	2	
Lattice panels 4'0" long x 7'8" high	2	
Lattice panels 1'6" long x 9'0" high	2	
Portable benches 3'6" long	2	
3" crown mould	10	lin. ft.
3" moulded fascia	31	lin. ft.
2 1/2" bed mould	31	lin. ft.
7/8"x6" frieze	28	lin. ft.
7/8"x3" frieze	28	lin. ft.
7/8"x6" soffit	40	lin. ft.
1 1/2" neck mould	10	lin. ft.
Front fascia with key, etc.	1	
5/8"x 2 1/4" M. & B. ceiling—to cover	40	sq. ft.
Living porch:		
6"x6" box cols., 7'8" long, with cap and base	7	
6"x4" box pilasters, 7'8" long with cap and base	2	
7/8"x6" soffit	78	lin. ft.
7/8"x3" fascia	41	lin. ft.
3" crown mould	41	lin. ft.
2 1/2" bed mould	38	lin. ft.
7/8"x10" frieze	74	lin. ft.
7/8"x3" frieze	37	lin. ft.
Solid paneled balustrade, panels both sides, cap, etc. (2'0" high)	37	lin. ft.

CARPENTRY (Continued)

5/8"x7 8" cove	111 lin ft
5/8"x2 1 4" M & B ceiling to cover	150 sq ft
Rear porch	
8"x8" box col, 7'8" long with cap and base	1
3" crown mould	12 lin ft
7/8"x3" fascia	12 lin ft
2 1-2" bed mould	10 lin ft
7/8"x6" soffit	12 lin ft
7/8"x10" frieze	20 lin ft
7/8"x3" frieze	10 lin ft
5/8"x7/8" cove	27 lin ft
7/8"x8" soffit	10 lin ft
5/8"x2 1/4" M & B ceiling to cover	14 sq ft
7/8"x6" floor fascia	10 lin ft
1 1/8"x2 1/4" cypress floor—to cover	22 sq ft
Windows	
Frames complete with sash, outside trim, etc. Sash 1 1-2" thick, glazed D. T	
Cellar Windows (trim both sides)	
Single top hung casem sash, 3'0"x2'6" 4 light	4
Mull. DH sash, each 2'6"x3'2" 12 light	1
First floor windows:	
Single D. H. sash, 3'4"x5'0", 16 light	4
Single D. H. sash, 2'10"x5'0", 16 light	1
Single D. H. sash, 2'6"x3'2", 12 light	2
Mull. D. H. sash, ea. 2'6"x3'2", 12 light	1
Triplet D. H. sash, ea. 2'6"x3'2", 12 light	2
Second floor windows:	
Single D. H. sash, 3'0"x4'6", 16 light	9
Single D. H. sash, 2'6"x3'2", 12 light	1
Single D. H. sash, 2'0"x4'6", 12 light	1
Triplet D. H. sash, center 3'0"x4'6", 16 light—ea. side 1'4"x4'6", 8 light	1
Third floor windows	
Single D. H. sash, 2'6"x3'2", 12 light	1
Single D. H. sash, semi-circular head, 2'6"x4'0", 13 light	2
Single hinged quart. circular, 2'0"	2
Shutters (1 1/8" thick, solid paneled):	
3'0"x5'1" pr	3 pr
2'6"x3'3" pr	5 pr
2'10"x5'1" pr	1 pr
Blinds (1 1/8" thick, fixed louvres):	
3'0"x4'7" pr	9 pr
2'8"x4'7" pr	1 pr
2'0"x4'7" pr	1 pr
2'6"x3'2" pr	1 pr
Exterior door frames (1 3/4" thick, rabbeted) Complete with outside trim:	
Front entrance frame, door 3'0"x7'0" sidelight sash 1'0"x5'0" with panels below, ornamental trim, etc	1 Unit
Frame for door to living porch, 2'10"x7'0"	1
Frame for rear entrance door, 2'8"x7'0"	1
Exterior doors (all to detail):	
Front entrance door, 3'0"x7'0"x1 3/4", 7 panel	1
Door to living porch, 2'10"x7'0"x1 3/4", glazed D. T	1
Rear door, 2'8"x7'0"x1 3/4", glazed D. T	1
Finished Flooring:	
Living Room, Dining Room, Ent. Hall, plain sawed white oak, 13/16"x2 1/4", to cover	500 sq. ft.
Kitchen, Pantry, etc., No. 1 maple 13/16"x2 1/4", to cover	182 sq. ft.
Second story, No. 1 comb grain Y. P., 7/8"x2 1/4", to cover	645 sq. ft
Third story, 7/8"x4" N. C. Pine, to cover	263 sq. ft.
Lining paper under floors	700 sq ft
Cement filled pipe cols. in cellar, 4" dia.x 7'6" long with caps and bases	6
Joist hangers (1/4"x2" W. I.):	
For 2"x10" beams	6
For 4"x10" beams	4
For 4"x8" beams	2

Interior Finish

Door trim (whitewood)	
7/8" jambs, 1 1/2" stops, 7/8"x4 1/2" moulded and mitered trim with wall moulding. Trim both sides.	
For doors, 2'6"x6'8"	8 set
For doors 2'4"x6'8"	7 set
For doors 2'4"x7'0"	1 set
For doors 2'4"x6'6"	4 set
For doors 2'0"x6'8"	1 set
Trim for inside of exterior doors	
Front entrance with sidelights, etc	1 set
Rear entrance, 2'8"x7'0"	1 set
Door to living porch, 2'10"x7'0"	1 set
Trim for cellar doors (plain)	
2'8"x6'8"	1 set
2'6"x6'6"	1 set
Trimmed openings finished same as for doors	
Opg., 5'0"x6'8"	2 sets
Trim for small door to plumbing pipe 1'6"x3'0"	1 set
Windows (whitewood):	
7/8"x4 1/2" moulded and mitered trim with wall moulding, 1/2" stops, 1 1/8" moulded stool 7/8" moulded apron, 5/8"x7/8" cove under stool.	
For windows, single 3'4"x5'0"	4 sets
For windows, single, 2'10"x5'0"	1 set
For windows, single, 2'6"x3'2"	4 sets
For windows, mull., ea. 2'6"x3'2"	1 set
For windows, triplet, ea. 2'6"x3'2"	1 set
For windows, single, 3'0"x4'6"	9 sets
For windows, single, 2'0"x4'6"	1 set
For windows, triplet, center 3'0"x4'6" each side 1'4"x4'6"	1 set
For windows, single, 2'6"x4'0" curved head	2 sets
For windows, single, 2'0" quarter circle	2 sets
Base:	
7/8"x6 1/2", moulded	490 lin. ft.
7/8"x4", plain (closets)	120 lin. ft.
2" base mould	490 lin. ft.
1/2" quarter round floor moulding	620 lin. ft
Picture moulding (7/8"x2 1/4")	400 lin. ft.
Mantel for living room	1 Unit
Seat for Bed Room No. 4	1 Unit
Interior doors:	
(2 cross panel birch veneer)	
Door 2'6"x6'8"x1 1/2"	8
Door 2'4"x6'8"x1 1/2"	7
Door 2'4"x7'0"x1 1/2"	1
Door 2'4"x6'6"x1 1/2"	1
Door 2'0"x6'8"x1 1/2"	1
Solid pine cellar doors:	
Door 2'6"x6'6"x1 1/2"	1
Door 2'8"x6'8"x1 1/2"	1
Whitewood doors:	
Door 1'6"x3'0"x1 1/8"	1
Closet shelving (7/8"x12" pine)	42 lin. ft
Hook strip (7/8"x4")	60 lin. ft.
Rabbeted shelf cleat	30 lin. ft
1" dia. pipe clothes rod	18 lin. ft.
Pantry cupboard, (front 3'0"x8'0") countershelf, drawers, doors, etc.	1 Unit
Slat floor under laundry tubs, 3'0x4'0"	1 Unit
Main stairs 1st. to 2nd. story. 14 risers, 3'0" wide, newels, turned balusters, balustrade at 2nd. floor, etc (whitewood)	1 flight
Cellar stairs, 12 risers, box pattern 2'8" wide, yellow pine hand rail, etc	1 flight
Stairs 2nd. to 3rd. floor, 12 risers, box type yellow pine, 2'8" wide, balustrade at 3rd floor, etc.	1 flight

GENERAL CONDITIONS

Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges.

Allow for general work not listed, such as grading, planting, etc. Include sub-bids such as Hardware and applying same, painting and decorating, plumbing and gas fitting, heating and electric work.

Industrial Buildings *of* Good Design

MODERN industrial buildings are being built more and more with the idea of securing good looking structures as well as having merely practical buildings.

Reinforced concrete enters largely into the construction of such buildings, the exposed concrete spandrels and columns can be made very attractive by intelligent design and good workmanship, and this can be combined with brick so as to secure a pleasing exterior design.

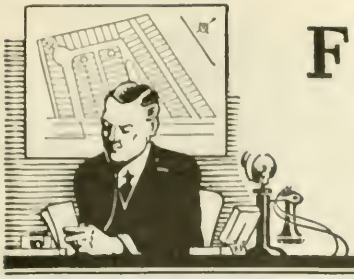
The smaller illustration shows the power house of the Wisconsin Public Service Company, located at Green Bay, Wisc. The lower illustration is that of the Larson Canning Company of the same city. Both these structures were designed and built by Ludolf M. Hansen Company of Green Bay, Wisc.



In other cases an entire brick exterior may be preferred and this can be relieved by some stone or cast concrete ornaments.

In a factory, a large amount of light is essential; therefore, practically the entire outer wall surface should be of glass. Of course in buildings of this sort, steel sash should be used exclusively as they have many advantages over wood sash and frames.





FINANCE and REAL ESTATE

Helpful Data for the Builder Who Builds to Sell

Mortgage Money Is Easier Now

IN a most comprehensive survey of the present real estate market and a forecast of the future, Charles F. Noyes, head of the firm of Charles F. Noyes Co., lays emphasis on the fact that mortgage money is decidedly easier and that the bona fide investor has at last returned to the market.

"The real estate business is exceptionally good in all its branches and never have we approached the usually dull Summer months with as much good business in sight," said Mr. Noyes.

"Mortgage money is very easy," continued Mr. Noyes, "and any good loan can be obtained at rates of from 5½ per cent to 6 per cent and a few good loans recently have been placed at 5 per cent. Five per cent money, however, is exceptional and security must be ultra-desirable.

"Business renting for the 1923 season is better than most advanced renting seasons. While rentals have dropped to stay dropped from the high point of war days, when office space commanded $4.00 to $5.00 per square foot, warehouse buildings 50 cents per square foot, and manufacturing lofts $1.00 per square foot, yet we all know that the old figures of prior to 1914 will not return.

"All leases now are being made on the basis of rentals that show a good income yield for the properties.

"Sales of real estate to investors now are being freely made, and a considerable amount of exchanging is being handled by the larger real estate offices.

"Money is plentiful and this is best emphasized by the fact that during the first three months of this year more than $5,000,000,000 in money has been in circulation, or an average of $51.25 per capita as against $35.05 per capita during the same period in 1914, and all of this money is eligible for investment. Not only is this great amount of money in circulation, but in 1920-1921 the aggregate resources of the national banks were nearly double those of 1914.

"The business man of large affairs finds himself at the end of the war period with odds and ends, and these with a little additional money he can convert into a substantial realty investment. This exchange movement, in my opinion, will grow and I predict that within six months one of the healthiest trading markets of my time will be in progress.

"The fact that real estate has proven itself to be the first one prime investment of all and is so regarded for the first time, even by men who formerly clung to Wall Street or bond investments, is accelerating this movement. The real estate market 'turned the corner' last January and now every month shows a steady and healthy gain, not only in volume of the aggregate amount over that of 1921.

WITH regard to the building situation throughout the country, S. W. Straus, of S. W. Straus & Co., says:

"As the season advances, increased activities prevail in all departments of construction, and there is substantial evidence that predictions made some time ago that the year 1922 would establish new building records, are being borne out. While there is an unprecedented amount of residential construction, there is activity in all other lines, including industrial plants.

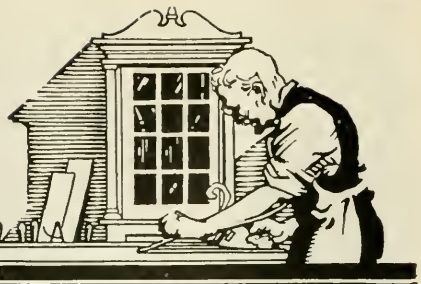
"There is a firm and well sustained demand for building capital. Prices for all basic materials show tendencies to stiffen up as greater activities get under way. The labor situation, viewed from the standpoint of the entire country, is favorable, and wages are holding up well, due to a greater demand as well as a lessened supply as the result of a considerable exodus of workers from some of the building trades.

"Perhaps the most salutary phase of the situation lies in the effect which increased building activities is having on general business. An optimistic note is to be observed throughout the entire realm of business in this country, and evidences of returning prosperity will undoubtedly multiply with the upward trend of building operations. A new building is the symbol of progress because in its construction there is involved substantially every line of trade and industry as well as increased land values in the vicinity where it is built.

The present extensive building program now taking place may be viewed as the tangible manifestation of national progress and prosperity, and its continuation is bound to have a stimulating effect on all departments of business."

SHOPWORK *and* FURNITURE

Designs for the Finish Man



Kitchen Closets

THERE is one important point that a good housewife will insist upon and that is adequate kitchen closets.

The biggest hit a builder can make with his customers is to suggest a good array and variety of closets to be built in the kitchen. The two illustrations shown herewith are typical examples of good kitchen closet arrangements.

Notice in the cupboard arrangements, that the doors do not extend to the floor. This allows the first shelf to be about 6 inches above the floor level and in this little scheme many housekeepers find a decided advantage.





The proper hardware should be put on all doors and drawers. A mistake is often made in using a cheap variety, but this is a deplorable practice. There is nothing in the house that gets as much use and handling as the kitchen equipment and good hardware here will always be admired.

An ironing board closet is a very desirable adjunct to the modern kitchen. A convenient electric plug should be installed so that the electric iron is available.

In figuring out the closets to be installed, it is wise to mark down the different items of kitchen equipment that are to be kept out of sight and then make proper provisions for these various items. There should be proper space for brooms, mops, dusters, etc. The shelves should be arranged at different heights so as to accommodate tall bottles.



CARPENTRY

Good Practice in Frame Construction and Finish

How to Frame a Roof of Unequal Pitch

By RICHARD M. VAN GAASBEEK

School of Science and Technology, Pratt Institute, Brooklyn, N. Y.

CONTINUING the problem from our May issue, we can now proceed to lay out the jack rafter on the long, common side. In our next article, we will show how to lay out the jack rafters on the short, common side.

The length of jack rafters No. 12, 13, 14 and 15, are determined in the same manner as the preceding common rafter No. 16, as they are a part of the length of it. Take the runs from the lay-out, figure 1, (printed in the May issue) measuring from facia line A to the center of the hip. The four rafters are shown developed on the side of a single rafter, figure 4. In practice these would be laid out separately and are laid out over one another, only to save space and to avoid repetition.

Press the fence firmly against the top edge of the stock to be used, using the same figures on the square as for the previous rafter and produce the facia line or first plumb line to the extreme right, A, figure 4. Slide the fence to the left and measure on a level line from facia line A, the run of rafter No. 12, 2¾", the run of rafter No. 13, 5½", the run of rafter No. 14, 8¼" and the run of rafter No. 15, 11", and produce plumb line C, figure 4, the extreme length of the rafter to the center line of the hip rafter.

From this length, deduct one-half the thickness of the hip, measured on the line of the jack rafter or one-half the diagonal thickness of the hip, C-D, figure 5, which is an enlarged section through W-W-figure 1, and produce plumb line D, figure 4. Square this line across the top edge of the rafter and locate the center.

To simplify picking up the bevel for the top cut, draw in a section of the hip and jack rafter, full size on the lay-out, figure 1, as shown in the section, figure 5.

Where the outside edge of the jack rafter intersects the outside edge of the hip rafter, square a line across at right angles to the center line un-

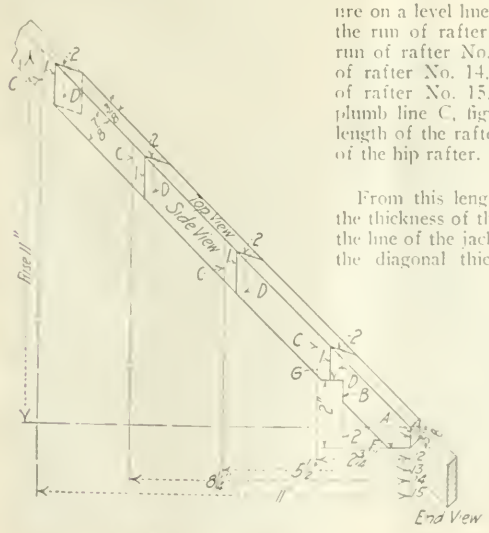


Fig. 4—Developed Length of Jack Rafters No. 12, 13, 14 and 15

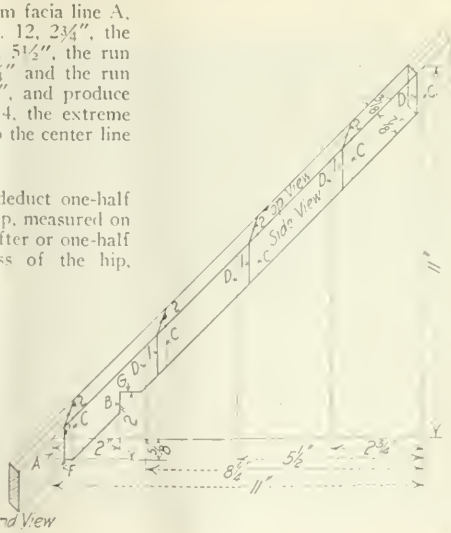


Fig. 6—Developed Length of Jack Rafters No. 17, 18, 19 and 20

til it intersects the center line as at I, figure 5.

To lay out the top, cut so that the jack rafters will fit against the side of the hip rafter at the proper angle, measure back on a level line from plumb line D, on the side of the rafter, figure 4, the distance D-1, figure 5, and produce plumb line 1, figure 4. Connect plumb line 1 through plumb line D on the center line as shown at 2, top view, figure 4. The lower end of the rafter is a duplicate of the long, common rafter. Measure in from facia line "A," measuring on a level line, 2", the width of the projection, locating wall line "B." Measure down on facia line A, from the top edge of the rafter, 5/8", the width if the facia, locating plancher level F. Measure up from plancher level F, measuring on plumb line, 2", locating plate level G. Cut on line A, for the facia, on line F, for the plancher level, on lines G and B for the birdsmouth and on bevel 2 on the top edge and plumb line 1 for the cheek cut against the hip rafter.

The length of jack rafters Nos. 17, 18, 19 and 20 are determined in the same manner as the preceding jack and common rafters, with the exception that the top and bottom cut are different. Take the runs from the lay-out, figure 1, measuirng from the center of the ridge to the center of the ridge, 3/16" and produce of the valley rafter.

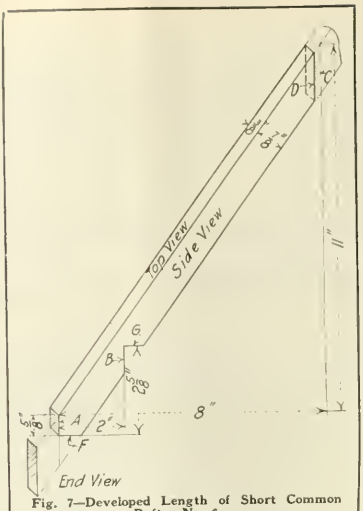


Fig. 7—Developed Length of Short Common Rafter No. 6

The four rafters are shown developed on the side of a single rafter, figure 6. In practice these would be laid out separately and are laid out over one another, only to save space and to avoid repetition.

Press the fence firmly against the top edge of the stock to be used and produce the first plumb line to the extreme right, "C," figure 6. Slide the fence to the left and measure on a level line the run of rafter No. 17, 11", the run of rafter No. 18, 8¼", the run of rafter No. 19, 5½" and the run of rafter No. 20, 2¾", and produce plumb line C, figure 6, the extreme length of the jack rafters to the center line of the ridge. From this length, deduct one-half the thick plumb line D, the cutting length of the rafter against the ridge.

The bottom end of all four rafters are beveled to make a fit against the side of the valley and jack rafter No. 17 also has a bearing on the plate so that the plancher level and birdsmouth must be laid out as for the common rafter.

To lay out the birds-mouth for rafter No. 17, measure in from plumb line, A, figure 6, measuring on a level line, 2", the width of the projection, locating wall line B. Measure down on plumb line A, from the top edge of the rafter, 5/8", the width of the facia, locating plancher level F. Measure up from plancher level F, 2", measuring on a plumb line, locating plate plate level G.

Plumb line A, represents the extreme length of the jack rafters to the center line of the valley rafter so that from this length deduct one-half the thickness of the valley, measured on the line of the jack rafter or one-half the diagonal thickness of the valley, C-D, figure 5, which is an enlarged section through W-W, figure 1, and produce plumb line D. Square this line across the top edge and locate the center.

The top cut for these rafters are the same as for the preceding jack rafter, as all rafters on the long common side of the hip and valley rafters are the same pitch.

To lay out the bottom, cut so that the jack rafters will fit against the side of the valley rafter at the proper angle, measure forward on a level line from plumb line D, on the side of the rafter, figure 6, the distance D-1, figure 5, and produce plumb line 1, figure 6. Connect plumb line 1, through plumb line D on the center line as shown at 2, top view, figure 6. Cut on line D, for the cut against the ridge, and on bevel 2 on the top edge and plumb line 1 for the cheek cut against the valley rafter, on all four rafters and on rafter No. 17, only, cut on line F, for the plancher level and on lines G and B for the birdsmouth.



Model of Roof with Unequal Pitches

To Lay Out Short Common Rafters

Before setting the fence and square the pitch, or rise in inches per foot must be determined, the run, a constant unit, 12″, remains unchanged. The run of short common rafter No. 6, measured on the layout, figure 1, measuring from the facia line to the center of the ridge is 8″. The total height from the top of the facia to the top of the ridge "C," A C is 11″. This height is determined by the pitch of the long, common rafters as required by the specifications, which gives the total height of the roof. Thus, with the total rise 11″ and the total run 8″, find the rise in inches per foot. The formula or rule for finding this is:

$$\frac{\text{Rise in inches}}{\text{Run in feet}} = \text{Rise in inches per foot}$$

Working this out as given in the problem we have:

$$\frac{132}{8} = 16\tfrac{1}{2} \text{ rise in inches per foot.}$$

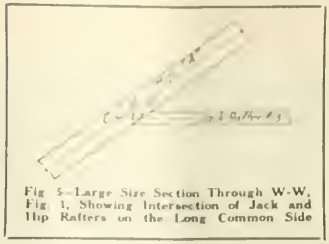


Fig. 5—Large Size Section Through W-W, Fig. 1, Showing Intersection of Jack and Hip Rafters on the Long Common Side

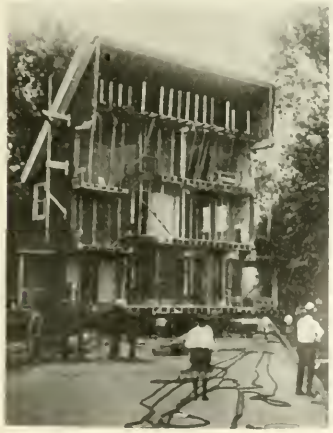
Set the fence and square at 16½″ rise on the blade and 12″ run on the tongue. Mark on the blade for all plumb cuts and on the tongue for all level cuts.

Press the fence firmly against the top edge of the stock to be used and produce the facia line or first plumb line to the extreme left, A, figure 7. Slide the fence to the right and measure on a level line from facia line, A, the run of the rafter 8″, and produce plumb line C, figure 7, the extreme length of the rafter to the center line of ridge "C." From this length, deduct one half the thickness of the ridge, 3/16″, and produce plumb line "D," the cutting length of the rafter against the ridge.

To complete the lay-out of the lower end of the rafter, measure in from facia line, "A," measuring on a level line, 2″, the width of the projection, locating wall line "B". Measure down on facia line "A," from the top edge of the rafter, 5/8″, the width of the facia, locating plancher level "F." Measure up from plancher level "F," measuring on a plumb line, 25/8″, (be sure to take this distance from the lay-out, figure 2, noticing that the short common rafters rest on plates M and O which are 5/8″ higher than plates J and L on which the long common rafters rest), locating plate level "G." Cut on line "A" for the facia, on line "F" for the plancher level, on lines "G" and "B" for the birdsmouth and on line "D" for the cut against the ridge.

Easy to Move by Cutting the House in Half

A VERY interesting moving of a house was successfully accomplished in Marlborough Street, Flatbush section of Brooklyn, N. Y., as the house was too wide to go through the streets the resourceful house mover solved the difficulty by "simply" cutting the house in half and moving the sections one at a time to their new location, where it was put on a new foundation and joined together as a complete house again. Note particularly how the unsupported ends of the joists were braced so as to prevent a collapse. The scaffold brackets were not removed, these were used for the planks on which the workmen stood while cutting the house in half.



The photograph, by Underwood and Underwood, shows the one section ready to be moved on its new site, the foundations being already built in place.

ANOTHER interesting example of a house moving job is shown in the second picture. Here a portion of the house is shown on the rollers and skids. Some overhead wires required cutting, and that is why the lineman is on the job.

This is half of a three story house that was moved at Newton, Mass.

The section shown here, weighing approximately forty tons, was moved along Commonwealth Avenue of that city.

The house was formerly located on Center Street and Commonwealth Avenue and was moved a distance of one-quarter mile from its original spot.

It is interesting to know how buildings of this sort are moved, a large building being cut in half to make two smaller structures.





CONTRACTING EQUIPMENT

Reliable Information on Time and Labor Saving Devices

Basement Excavator

By DALE R. VAN HORN

THIS article describes the construction of a simple excavator of small size but large capacity which was once built primarily for the purpose of enlarging the basement under a house. It proved so effective, however, that it was eventually used by neighbors and finally fell into the hands of a contractor, who may be using it yet, or one like it, for all I know.

The writer had purchased a frame residence in the edge of a small country town. Though well built and modern, it did not have ample basement space. Less than half of the area covered had been dug out.

With the three or four small windows offering the only means of getting out the surplus earth, once it had been decided to enlarge the basement, unless a portion of the wall were removed, this step would be both expensive and risky. So the excavator or elevator was made.

Figure one shows a side elevation with a rather graphic pose. The elevator was made by using two one by eight-inch boards fourteen feet long for the side pieces and a twelve-inch plank for the bottom. Wood rollers, one at each end, took care of the belt or conveyor and a hopper at the lower end with removable sides, served as the inlet. A light iron wheel two feet in diameter was keyed to the upper roller and the one and a half horsepower engine belted to this. And it is a surprising fact that that little "one and a halfer" lifted the dirt as fast as two workmen inside could load it into the hopper. Of course, the earth thus removed was dumped just outside the window but that is as far as it would have been thrown, anyway. As the work progressed within, the conveyor was slipped over the window sill and the engine moved forward.

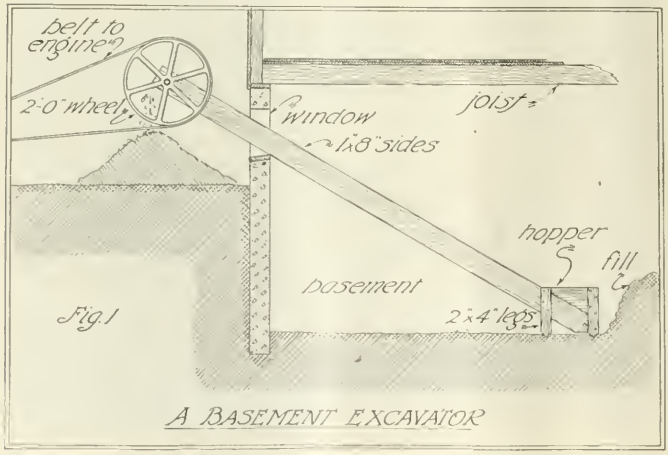


Fig. 1

A BASEMENT EXCAVATOR

The other illustration shows most of the essential details though many of them can be altered to suit various conditions. There is the matter of the bottom. Instead of nailing the plank at the bottom edges of the boards it was placed one inch below the middle. In this way the conveyor belt is given room to clear the sill without scraping. The three inches left above the upper side of the belt is ample, anyway, for the earth being removed.

The plank was cut five inches shorter than the sides to allow room for the upper roller. The rollers in this case were cut from a roller on an old binder. Holes one-half inch in diameter were bored into each end and into these were driven squared rods to a tight fit. To one of these rods was keyed the pulley wheel. This was made secure by running a small bolt through both the roller and the rod so that there would be no chance of slipping.

The top of the chute was braced by a strip across the top as shown; and it would not be a bad idea to add two vertical two-inch strips at the ends of the chute through which to bore the holes for the bearings. In

this way the bearing surface will be increased from a scant inch to nearly three inches on each side.

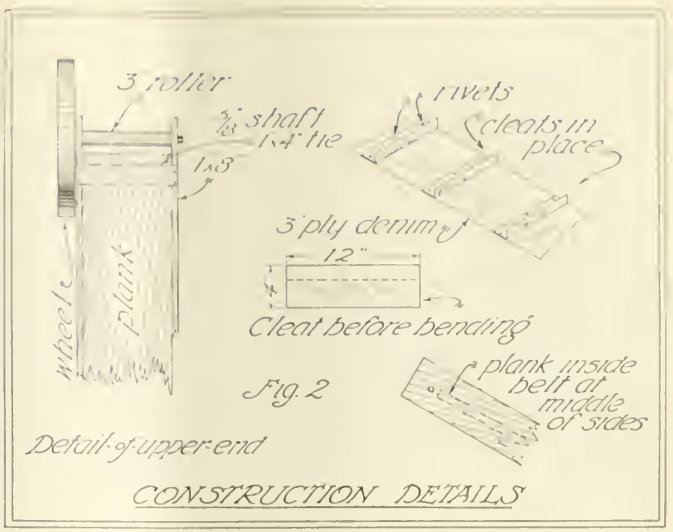
In the case being cited blue denim one yard wide and folded twice, making three laps was used for the belt. It would probably be best to get light weight canvas or heavy duck, since this would be a little cheaper.

The belt, after being folded was sewed with coarse thread lengthwise on a sewing machine and the edges sewed several times. If I remember right, something like thirty seams were sewed into this belt.

The belt was cut somewhat longer than necessary and the ends turned back and these sewed down. Before it was placed, heavy galvanized strips, bent to the form shown were riveted at twelve-inch intervals along the stretch. They were eleven inches in width, rather than the full twelve, to prevent a possibility of their scraping along the sides of the chute.

These being fastened, the ends were cut to the proper length and the belt placed and lacing used to sew the ends together. The cloth stretched badly, and it was necessary to take up slack several times before the job was finished.

It would be a wise thing to provide an adjustable roller at the lower end so that the slack could be taken up with a wrench by turning two bolts.



There was a little friction between the upper side of the bottom and the rivets holding the cleats in place, but they soon signed the treaty and no further trouble was experienced along that line.

Another thing which bothered a bit was the slipping of the belt on the upper pulley. This was natural since the surface of the roller was so small that wood to cloth was hardly sufficient. A little molasses fixed that.

Any one who had a little pluck and even less capital can outfit himself with one of these simple outfits and fare forth to a good job and good wages. For with it one man can do the work of three. By looking ahead to unusual jobs, certain parts can be made detachable so that as little time as possible will be lost in setting up.

Careful selection of the lumber used, especially for the sides, will prove worth while, too.



Tractor Use

RAISING the bents of a barn is always more or less of a job. Here is a picture of a simple method of accomplishing it without the aid of many men and horses.

A little tractor does the job. This shows a practical use for tractors in building operations and there are many such uses around any building construction of fair size.

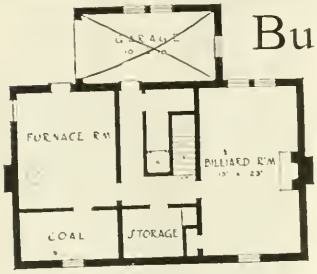
The cost of operating a small tractor is not very much and it seems that in the near future a tractor will be just as valuable to the contractor as the motor truck.

Machinery is more and more taking the place of manual labor in building construction and this is another illustration of how it is working out.

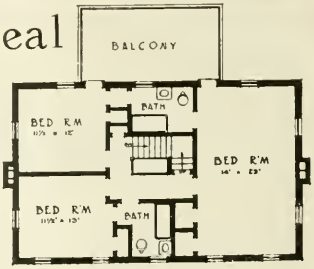


Building *the* Home Ideal

Interesting Model House Building Operation Incorporating Many Modern Features



CELLAR



SECOND FLOOR
2 ROOMS ON THIRD FLOOR

MALBA, Long Island, New York, is the scene of a novel building undertaking that is creating considerable interest among the builders in the vicinity and interested home builders.

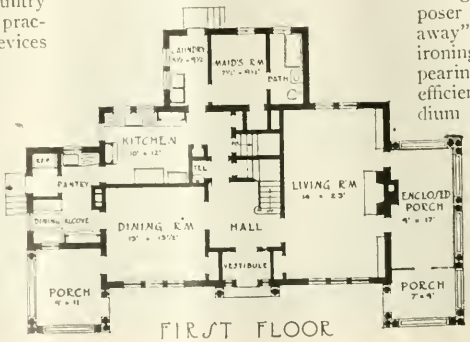
The Malba Estates Corporation, the developers of the property, are erecting a model all-year country home that is to contain many practical, modern labor-saving devices and household appliances.

The project was conceived, and is being built for the purpose of showing prospective home builders the best and most desirable materials, equipment and fixtures for a modern home.

An attempt is being made to include every device and appliance that can be used, and the builders would be glad to hear of any item they have overlooked to include in their list and which is not covered with some other device in practically the same line.

This house represents the results of years' of experience in home building, combined with the co-operation of many building authorities, architects and home efficiency experts.

The construction will be of pressed red brick with common brick backing; copper shingle roof, and the beams and girders of the first floor will be of steel lumber.



FIRST FLOOR

Among the special features there will be: All built-in china closets, bookcases, window seats, hidden radiators, electric clothes washer, ironer, vacuum-cleaning system, ice-making refrigerator, ventilating system; patent kindler and ash chute in fireplace and lift for logs; cold storage room; package receivers; disposer for household waste; "Tuck-away" folding ladder; folding wall ironing-board, laundry chute; disappearing screens; safety hidden vault; efficiency kitchen, dining alcove, radium markers, bells and buzzers, speaking tube; closet with sliding hangers, raised floors, and door control lights; radio room and flower studio; patent coal chute and rotary ash receiver; copper sash cords, water filterer, thermostat heat regulator, phone closet; numerous other home innovations that will appeal to discriminating owners.

What the Editor Thinks

Threatening Building Prosperity

DURING the war, the word "profiteer" came into very general use against some certain unscrupulous individuals and corporations. That ugly word is being used quite freely today against some building supply dealers on account of their raising the price of some building commodities because of the demand for same.

In the city of New York the building industry has the greatest volume of work, on hand and under contemplation, known in its history, and the supply of bricks on hand is not enough to meet the demand.

Unfortunately, a rather near-sighted policy has grasped some brick supply men and they have boosted the price until it is quite a serious matter. A threat was made to import foreign brick by Samuel Untermyer at a recent meeting held in New York to investigate these unjust prices.

Now, American workmen and industry need every dollar that it is possible to earn and this is an un-American way of handling the situation.

The National Lumber Merchant in a recent issue also sensed this danger in its relation to the continued prosperity of the lumber dealer. They said:

"Lumber prices are rising rather rapidly these days, indicating that unless the 'brakes' are applied—somewhere and somehow—there will be another run-away market.

"The consuming public, the buyers—your buyers and every other retail lumber dealer's buyers—applied the brakes two years ago by simply refusing to buy. Will they do it again? That depends."

It is strictly up to the supply men to maintain a fair price for brick and other building commodities. If they do not, they will be the ones to suffer from a slackening up on the extensive building program which is now so well under way.

It must be remembered that when it no longer pays to build, building will not go forward.

You can only get business by selling your commodity at a fair and reasonable price. As soon as the gouging starts, the brakes are applied to the industry. Remember the goose that laid the golden egg—don't kill it.

Our Front Cover Design

DUTCH Colonial architecture is a popular type used for home construction and a very beautiful example is shown on our front cover this month.

As will be noted, the first story is of stucco, with the upper gable part and roof covered with wood shingle. The front entrance steps are of brick and the porch floor is cemented. A glassed in porch or sun parlor forms an interesting feature.

This house is located at Great Neck, Long Island, N. Y., and is the residence of Mr. M. Gaylord, and Messrs. Terrwilliger & Sohn of New York were the architects.

To build homes like this that fit so admirably in the landscape is a credit to the building industry.

Building Ideal Homes

IN different sections of this country the public's attention to home building is frequently secured by means of some houses that have been especially built for show purposes. These buildings are usually put up through the co-operation of the Local Builders Exchange or by some group of manufacturers, or the developers of a certain parcel of land.

Interesting examples of this are the numerous "homes electrical" which contain practically every electrical device to make house work easier.

Frequently a complete home is erected on some new development and the public invited to inspect a complete and newly furnished home, the furniture in the majority of these cases being obtained from local furniture dealers and house furnishing houses, and it is desirable publicity for all concerned.

A modern home is being built at Akron, Ohio, by the Builders Exchange of that city. This is rapidly nearing completion. It is an interesting example of builders getting together to spread the idea of better building.

Another interesting house is being erected at Malba, N. Y. This is described on another page of this issue. In an early issue we will have an article about an ideal home building erected in Baltimore and which was visited by over 30,000 people.

As these homes contain many desirable appliances they are very valuable as they tend to educate the public to the better things in construction and equipment of modern homes.

Show the people what a real house can contain and we will create a demand for better buildings.

Raising the Standard of Our Industry

ON another page we publish an interesting account of the formation of the American Construction Council. This is a big progressive step in advancing the interests of the construction industries and we certainly expect great things of it.

An industry of so much importance to the wealth of the country and the comfort of its inhabitants deserves a good deal of serious attention on the part of the general public. It will be part of the work of the American Construction Council to bring together different units of the construction industry so that they can better co-ordinate their efforts and methods of working so as to secure better and more economical results.

Another important point that the Council will be called upon to solve is the relations of labor to the employer and public. There must be some means of adjustment that is absolutely fair to all three parties and it is to be hoped that one of the earliest works undertaken by this new Council will be some method to eliminate disputes and strikes.

Every progressive member of the building industry will certainly lend his co-operation to this progressive movement.



PAINTING

Practical Points of Interest to the Builder

Finishing the Floors of the Smaller House

By A. ASHMUN KELLY

THERE are two ways that may be employed in finishing the floors of the average small or medium house. The floor most often painted is the floor of the kitchen, and where the wood is rather soft it is an ideal finish.

Some think paint the best for any kind of wood that may be laid on the kitchen floor. However, most people will want a hard pine flooring, and want this finished au natural, which means either oil rubbed in, or shellac, or liquid filler and varnish, or, not very likely, waxed. Wax will not do because it will not stand water or soap. But for any room where washing is not necessary, such as bedroom and hall, a waxed effect is good.

For a maple floor the first coat is of shellac, as oil will discolor this wood. After the shellac may come the wax. Or clear copal varnish, one or two coats, may follow the shellac, as varnish wears better.

The finishing of a hardwood floor —and by this is meant wood hard and soft—is not a difficult matter, any handy person may do it, but the re-doing of a soiled floor is something different, and then it requires an expert, to know just what is best to do. Wax soon discolors with wear, becomes dirty in spots, and must be removed and the part renewed with wax.

The proper care of a finished floor is also important, for even hard varnish will not stand all the abuse that sometimes is heaped upon a floor.

The varnish used should be that made particularly for a floor. It dries over night fit for walking on in the morning, yet it is sufficiently elastic not to ever crack.

As to the cost, there is no reason why the floor of a low cost house should not be as well finished as that of the mansion; the extra cost in the latter case comes from the scraping and smoothing, mostly, for which more may be paid than an average good floor will cost, including the laying.

Floors require a great deal of attention to keep them in proper condition. The public expect floors when done to last for years, without giving them any care, and the painter is blamed for poor wearing qualities. They forget that iron, marble, or wood will wear down. That being the case, what can be expected from a shellac or varnish gum?

Be sure that the floor is scraped perfectly smooth before any finish is applied. And use only the very best of material if the job is to be a good one.

Some Paint Brush Hints

THIS is a criticism of a little item that appeared in the May number of THE BUILDING AGE. In the first place a real painter never lets his brush lie in the paint, as the article suggests. If he is done with it for a few moments he simply lays it across the paint pot. If done with it for the day, he wipes down the pot and removes all the paint he can by wiping it in the edge of the pot, then places it in water, either in a pot of water that will cover the bristles—and this is not the best way, either; or has a trough with water in it, and in which he places the brush, so that it cannot rest on the ends of its bristles, but on its side.

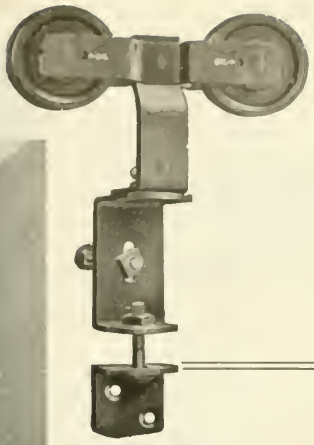
It is all right to bore a hole in the handle of a paint brush and suspend the brush thereby across the pot, in which there is water enough to cover the bristles only. That is a nice way, but it is seldom used.

No, no, you must not let the brush lie in the pot of paint, not for a moment. Nor is it ever done by a real painter. As to the pot of paint, if it is to stand over night, pour over its surface oil enough to cover it, or water will do as well. That will prevent the paint from skinning over.

A good paint brush costs money now, like evertything else, and it pays to take proper care of it. Keep it clean, don't let the paint dry in its butt, have a rag in pocket and keep brush handle and hands clean. Also wipe down the inside of the pot now and then while using the paint, and especially when done for the day, clean off the outside of the pot, and clean down the inside with the brush.

Remove surplus paint from brush by pressing it across the putty knife, held over the paint pot.





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1 Swivel Hanger
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1 Pair No. 40 Padlock Eyes

An All Year Round Garage

Build a garage so that the doors are just as easy to open or close in the winter as in the summer time.

As a builder or as a home owner you know the dread of trying to open the garage door in the winter, especially when the doors are equipped with poor sets.

This can be overcome by the use of our No. 805 Sliding and Swinging National Garage Door Set. The features of this set are: Ease of operation; weathertightness; adaptability and the small space required. As demonstrated by years of use, these features result in garage doors which work as freely and as easily as house doors, with just as little bother in their operation.

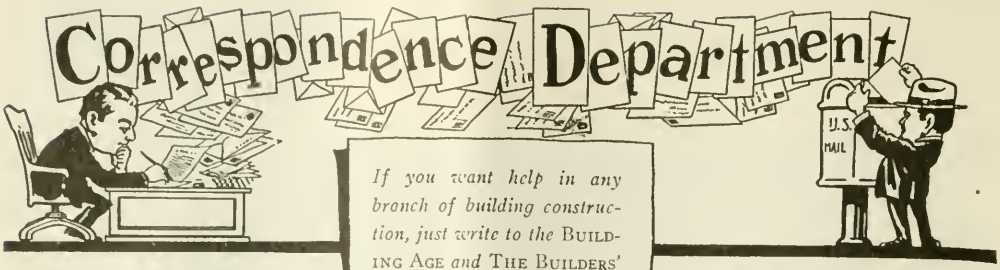
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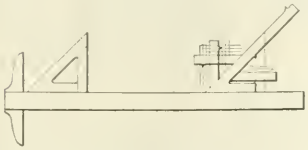


If you want help in any branch of building construction, just write to the BUILDING AGE *and* THE BUILDERS' JOURNAL *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Triangle Improvement for Detailing

THE improved triangle shown herewith can be made by anyone from an ordinary triangle merely by four simple saw-cuts freeing the vertical side, thereby permitting its use in conjunc- with the balance of the triangle for deft work in detailing small complicated areas that invariably occur on large drawings while the tee-square blade need not be moved.



Incidentally, this improved triangle serves as two triangles, practically eliminating the need of another one and thus simplifying the draftsman's equipment. The drawings illustrate its construction and use. This idea will apply only to 45 degree triangles.

Guide lines are scratched on the celluloid surface and saw-cuts are carefully made with a fine saw as indicated.—**C. Nye.**

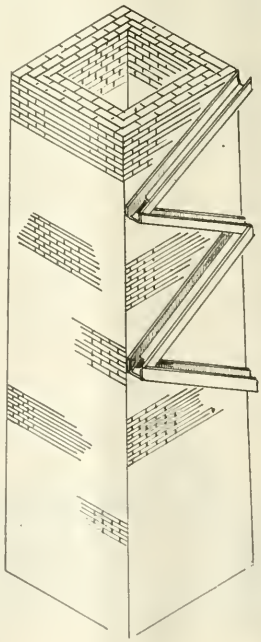
Razing a Chimney

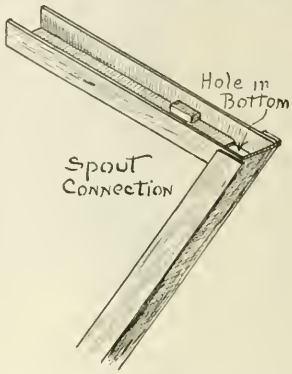
RECENTLY I used a method in razing an 80-foot high brick smoke stack that was new to me and I have near heard of it being used before and as it gave such good satisfaction I thought it would interest readers of BUILDING AGE AND THE BUILDERS' JOURNAL.

I used a spout put up in sections which were fastened to the sides of the stack. Each section had the proper slope to let the brick gently slide through same. At the lower end of each section there is a hole in the bottom through which the brick falls into the next lower section. The downward course of the brick is reversed as it passes from section to section thus controlling the velocity of same and when it arrives at the bottom it is not damaged by the force it strikes same

I found this method very convenient and economical as the spout is always ready and just the right height to receive the brick, there being no time wasted waiting on the other fellow. As the chimney is taken down the sections of the spout are disconnected and lowered to the ground.

We went to and from the work through the flue. We first put "Put



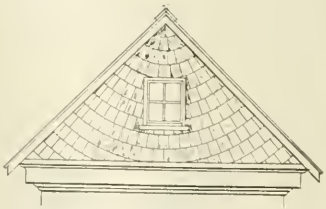


Logs" into the walls about five feet apart in height on which we placed our scaffolding boards.—**D. W. Daley.**

Circular Shingling

THE sketch shown herewith shows a rather novel and effective method of shingling the gables of frame houses so as to produce a circular effect.

Taking the mitre joints at the apex as a center and drive a nail at this point. With a string attached to this fixed center describe arcs at the proper distance apart.



The shingles should have the sides trimmed so that the joints will radiate or point to the nail center. This style of shingling may be done on the inverse curve or flowing effect may be had by cutting the bottoms of the shingles to irregular curves.

A good deal of ingenuity can be displayed in obtaining novel effects.

The principal point to be looked out for is to see that the distance is even between the different courses of shingles.—**Owen B. Maginnis.**



Residence—Highland Park, Illinois. Robert Seyfarth, Architect, Chicago. Exterior of Redwood Sawn Shingles

Redwood Special Sawn Shingles

IN residence construction these new style sawn shingles give an appearance of wide clapboards—a style which is fast becoming a distinctive feature of the better class of new residences in the Middle West and the East.

Side walls of Redwood sawn shingles suggest careful specification of the highest grade materials—give an air of distinction to a house which makes it easier to sell.

Redwood Special Sawn Shingles are either 24 inches or 26 inches long, as desired. Both sizes are $5\frac{1}{2}$ inches wide and $\frac{3}{4}$ inch thick at the butt. Laid 13 inches to the weather, they give the pleasing appearance shown in the illustration.

Made from clear, properly seasoned Redwood, these shingles do not warp. They take paint well and hold it indefinitely. Permeated with a *natural*, odorless preservative during the growth of the tree, Redwood lumber, shingles and millwork are protected against all forms of rot and decay. Their use for exterior construction gives greater permanence and value to any frame building.

For the convenience of builders and architects, we have recently issued our "Construction Digest" and our "Engineering Digest" which either our New York or Chicago office will gladly forward, together with such other information on Redwood as you may request. Write for them.

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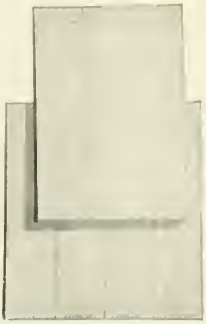
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Redwood should be specified for

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Including colonial siding, clapboards, shingles, doors and window frames, gutters, eaves, water tables and mouldings, porch rail, balusters and columns, rake, cornice and lattice, gables and fencing, pergolas and greenhouses.

Interior Finish
Natural stain redwood panels. Wood floors.

Industrial Uses
Tanks and vats for water, chemicals and oil, factory roofs and gutters—wood block flooring.

Wood Specialties
Such as Caskets and burial boxes, shipping cases, ice cream cabinets, cigar and army boxes, etc.

Railroad Uses
Such as [illegible] tunnel timbers, signal wire [illegible], water tanks, [illegible] lining.

Farm and Dairy Uses
Such as [illegible], stalls and troughs, [illegible] implement sheds, wood block floors, etc.

"The Western wood for Eastern homes"



HERE is a case where a builder took a contract to erect a building and complete it by a fixed date, writes a Canadian subscriber. "The work was not completed by the specified time as the contractor was disappointed in expectations in securing labor. Fine weather prevailing, it was agreed between the contractor and the building committee to open the building on a certain date, and completion was fixed for a week previous, with provision for $20 a day penalty for every day's delay after that. The weather having changed suddenly before that date, bringing snow and frost, the work was not completed at the time fixed. But the only work unfinished at the opening of the building was some outside trimmings, which did not affect use of the structure. Although it has been impossible to work outdoors for two months, the directors in charge want to enforce the penalty, although nothing has been lost to them through the building remaining unfinished. If they could be shown that a court would likely take a reasonable view and grant equitable relief they might give in."

Damages Chargeable Against Builder for Delay

We advise that the work be completed as speedily as is reasonably possible and that refusal to allow the $20 a day penalty be persisted in. We are confident that you will have no difficulty in establishing the proposition that the penalty is not assessable against you, although you may find it desirable to have local counsel assist you in effecting a settlement if the directors will not readily agree to a mutually satisfactory adjustment.

We believe that the Canadian law on this case will be found to be the same as the American law.

In the first place, if this provision for a daily penalty was an agreement not forming part of the original contract, it well may be doubted that it is valid. In that case it would certainly be necessary for the directors to establish some legal consideration for the provision. It is fundamental law that a promise to pay something which the promisor is not already bound to pay is not binding, unless supported by a consideration. And the existence of a consideration for a supplemental promise is not shown.

But there is a stronger reason why the penalty appears to be non-assessable—there is no actual or substantial loss resulting from the delay in completing the exterior work.

Without attempting to explain a quite complicated legal doctrine, it should be sufficient to say that all English-speaking courts recognize the rule that where an agreement to pay a stated amount as damages for breach of an agreement calls for payment of an amount manifestly disproportionate to and greater than the actual loss, it will not be enforced.

"A provision in a building contract for liquidated damages, in case of a delay or other breach, unless the delay or breach is excused for reasons specified, is valid where the damages that may be suffered must be of an uncertain nature or amount. *But the damages so designated must not be obviously unconscionable or unreasonable.*" 9 Corpus Juris, 705.

"Because of the difficulty of ascertaining with certainty the damages arising from the failure to complete building and construction contracts within the stipulated time, the parties to such contracts frequently provide for the payment of a specified amount as damages for failure to perform the contract in time, and the courts will enforce such a provision, although the delay results from an honest mistake of judgment on the part of the architect. *Liquidated damages for delay, however, can be awarded only from the time the building should have been completed until the time the owner has gone into occupancy of it.* . . . A statute stipulating that, in case of part performance on the date stipulated, a penalty may be correspondingly reduced, is applicable only where the owner can have useful occupation of the portion completed.

"A provision for liquidated damages. . . . has reference only to *inexcusable delays.*" 9 Corpus Juris, 794-795.

At pages 739-742, 9 Corpus Juris, numerous cases—Canadian, as well as American—are cited showing that where a contractor has honestly attempted to complete his contract and the work has been so far completed that the owner has gone into possession of it, using it, there is a substantial performance of the contract, such as limits the owner's rights to the recovery of damages actually sustained through the contractor's failure to fully perform.

But, while as indicated, we are of the opinion that the builder in this case is not liable for the penalty mentioned, and not for more than actual damages, we feel that he was negligent in his own interest if he failed to insist on a clause giving him credit for all delays due to interruption by weather conditions, labor shortage, etc. Such a clause would completely exclude any claim whatever on the part of the owner for such delays as are mentioned.

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age and The Builders' Journal, 920 Broadway, New York City.

ORDINANCES which unjustly discriminate against the use of particular kinds of building materials or methods of construction will not be sustained by the courts.

Power of Municipalties to Limit Construction Methods

One of the latest authoritative coure decisions on this important subject was handed down by the Illinois Supreme Court in the case of McCray vs. City of Chicago, 126 Northwestern Re-

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JOHNSON'S FLOOR VARNISH

porter, 557. The court annuls an ordinance of the defendant city containing provisions that in all buildings of ordinary construction wood lath shall not be more than 1½ inches wide, shall be nailed to each stud, joist or bearing with not less than a three-penny fine 16-guage nail; lath to have joints broken with not over seven lath to a break; lath to be spaced not less than one-fourth of an inch apart, and to be covered with at least two coats of plaster, making the lath and plaster finish to at least seven eighths of an inch in thickness.

The court recognizes that an ordinance regulating building will be sustained as being valid if it has any reasonable tendency to promote the public health or safety, but adds:

"To justify the public authorities in interfering with the rights and privileges of the owners of property, as provided by the ordinance here in question, 'it must appear: First, that the interests of the public generally, as distinguished from those of a particular class, require such interference; and, second, that the means are reasonably necessary for the accomplishment of the purpose, and not unduly oppressive upon individuals. The Legislature may not, under the guise of protecting the public interests, arbitrarily interfere with private business, or impose unusual and unnecessary restrictions upon lawful occupations. In other words, its determination as to what is a proper exercise of its police powers is not final or conclusive, but is subject to the supervision of the courts.' [Quoting from a decision of the United States Supreme Court.] . . .

"Appellants charge that this ordinance, requiring wood lath and plaster in all buildings of a certain kind, tends to create a monopoly, because there are other materials equally safe that secure the same results. . . .

"The validity of the ordinance here in question must be determined by its operation and effect with respect to its exclusion of the use of Preferred Bestwall three-eighths of an inch thick, and not by the desirability of preventing the use of Beaverboard, Sackettboard, or any other of the numerous paper or wall boards less than three-eighths of an inch thick, regardless of how desirable or undesirable any of those boards may be. The proper way to reach the evil is to regulate the use of wall boards and not to suppress their use. . . .

"We believe the ordinance in question is unjust and oppressive in its discrmination as to the material to be used for the partitions and ceilings of the rooms in ordinary dwelling houses. This being so, it must be held that these provisions of the ordinance are void, and should have been so declared by the trial court."

EXTREMELY important is the decision handed down by the Arkansas Supreme Court in the case of Buckeye Cotton Oil Co. vs. Kaucher, Hodges & Co., 238 Southwestern Reporter, 1. It deals with the responsibility of a contractor for increased building cost to the owner due to inefficient labor employed.

Inefficient Labor Under Cost Plus Contracts

Defendants contracted to erect for plaintiff a reinforced concrete building near Little Rock "for a compensation equal to 8 per cent of the actual construction cost." They guaranteed that the cost should not exceed $76,463, subject to this condition:

"This guaranty is made during existing conditions and does not apply should the work be interfered with or cost increased by any act of government or any unforeseen elements or acts of God."

The building cost more than $20,000 more than the estimated cost, and the owner sued to compel the contractors to reimburse it for the excess cost. The defense interposed was that the increased cost resulted from changed conditions respecting prices of labor and material and inefficiency of labor.

The court upholds the defense so far as concerns increased cost of labor based on increased wage scales, but not as to increased cost due to mere inefficiency of labor employed. Referring to the terms of the guaranty above mentioned, the court says:

"What the language means is that, if there was any increase in the cost of the building aside from those causes stated in the exception, appellants should be responsible for it under their guaranty. Now, the language of the exception does not, we think, include any estimated increased cost by reason of the inefficiency of labor. The increased cost of labor and materials was easily ascertainable and was within the contemplation of the parties at the time the contract was entered into.

"It was their manifest intention to exempt appellants' liability on account of increased cost of the building from those causes. But the question of the inefficiency of labor is a thing so vague that it could not have been within the contemplation of the parties that an estimate should be taken of the degree of inefficiency of labor during the construction of the building.

"In fact, that was one of the things appellants undertook to do and were paid to do in selecting the right kind of labor, and there is no proof in this case which would justify the finding that they could not have done that so as to reduce to a minimum in degree the inefficiency of labor.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912.

Of Building Age and The Builders' Journal, published monthly at New York, N. Y., for April 1, 1922.
State of New York } ss.:
County of New York }

Before me, a Commissioner of Deeds, in and for the State and County aforesaid, personally appeared C. G. Peker, who, having been duly sworn according to law, deposes and says that he is the editor of the BUILDING AGE AND THE BUILDERS' JOURNAL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Building Age Publishing Corporation, 912-920 Broadway, New York City.

Editor—C. G. Peker, 912-920 Broadway, New York City.

Managing Editor—C. G. Peker, 912-920 Broadway, New York City.

Business Manager — David Meyers, 912-920 Broadway, New York City.

2. That the owners are:

Building Age Publishing Corporation, 912-920 Broadway, New York City.

That the stockholders owning or holding one per cent. or more of the total stock of Building Age Publishing Corporation are as follows:

B. A. & C. P. Holding Corporation, 1 Madison Avenue, New York City.

3. That the stockholders owning or holding one per cent. or more of the total stock of B. A. & C. P. Holding Corporation are as follows:

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4. That the known bondholders, mortgagees, and other security holders owning one per cent. or more of total amount of bonds, mortgages or other securities are:

Architectural and Building Press, 243 West 39th street, New York City.

5. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than so stated by him.

CHARLES G. PEKER, Editor.

Sworn to and subscribed before me this 21st day of March, 1922.

[Seal] SADYE BLUMENFELD,
Commissioner of Deeds,
New York City, No. 23023.
Certificate filed N. Y. County, No. 73.

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News, Notes and Comment

Production of Stone in 1921

ABOUT 62,400,000 short tons of stone was quarried in the United States in 1921, according to the United States Geological Survey, Department of the Interior. This is more than 20 per cent. less than the production in 1920. The estimated value of this stone is $92,500,000, a decrease of 30 per cent. as compared with 1920.

Producers all over the country stated that both wages and prices had been reduced, and nearly all reported a decrease in the cost of production. High freight rates are said to have contributed largely to the general depression in the industry.

Building stone was in but little demand, and the returns at hand indicate a decrease in output of about 25 per cent. The output of monumental stone, which has shown practically no diminution during the last five years, apparently decreased more than 45 per cent. Paving blocks were in great demand, and increases were shown in the sales of curbing and flagging, facts that indicate a revival in street work in cities and towns. The campaign begun for the betterment of suburban and country roads caused an increase of nearly 8 per cent. in the output of crushed stone. Depression in the metal-smelting industry was reflected in a decrease of more than 50 per cent. in stone sold for fluxing and for use as refractory material. Decreases were noted also in the demand for agricultural limestone, and for stone used by alkali works, sugar refineries, paper mills, and in other manufacturing establishments throughout the United States.

Production of Gypsum in 1921

ACCORDING to conservative estimates made by the United States Geological Survey from the incomplete returns available April 1 the quantity of gypsum mined in the United States in 1921 was approximately 2,870,000 short tons, as compared with 3,129,142 tons in 1920. The combined value of the crude and calcined gypsum sold was approximately $20,820,000, as compared with $24,533,065 in 1920.

Book Reviews

Hendrick's Commercial Register of the United States: This 1922 edition contains 2,166 pages; published by S. C. Hendricks Co., Inc., 70 Fifth Avenue, New York City. Price $12.50.

The 30th annual edition, 1922, has just been published of this useful directory of the engineering, hardware, mining, chemical, architectural and building and other industries.

It contains a list of manufacturers, jobbers, purchasing agents, architects, etc., and will prove a very valuable reference book to any buyer.

* * *

The Electric Range Hand Book, 4th edition: This is a 122-page book; published by the Society for Electrical Development, 522 Fifth Avenue New York City. Price $3.00 per copy.

This book is on the installation and handling of the electric range. It contains very valuable information for the electrician as well as for the builder who contemplates putting an electric range in the kitchen of up-to-date apartments and private residences.

Hand Book of Standard Details by Charles H. Hughes: This is a cloth bound book of 312 pages; published by D. Appleton & Co., New York. Price $6.00.

This book contains convenient forms, tables and formulas of standard details useful in designing. It is intended more for mechanical engineers, but will be especially useful to contractors and draftsmen.

* * *

Concrete, Its Manufacture and Use. Published by the Koehring Co., Milwaukee, Wis. 207 pages; cloth bound.

This is a practical reference book on the practical handling of concrete published by one of our largest manufacturers of concrete machinery. It is in no sense a catalogue but a practical treatise on the best methods of handling concrete and equipment. A nominal charge is made for a copy of the book.

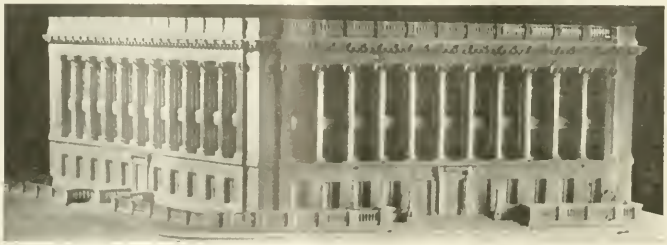
New Building of U. S. Chamber of Commerce

ON May 17th the corner-stone was laid for the new building to house the Chamber of Commerce of the United States. This building is being erected on Lafayette Square, Washington, D. C., on the site of Daniel Webster's old home. The building is estimated to cost $1,500,000.

The illustration shown herewith is a photograph of the model of the proposed building. In its architecture it follows the general lines of the recent public buildings erected in the Capital.

As is probably known to most of our readers, a comprehensive plan is being followed out to make Washington a City Beautiful.

The New Home of United States Chamber of Commerce



On the Site of Daniel Webster's Old Home

Corner-stone Laid May 17

La Fayette Square Washington

Now Ready for Distribution to Contractors

"COPPER ROOFING"

A Manual of Up-to-Date Practise
in the Erection of Copper Roofs,
Copper Flashings, Copper Gutters,
Copper Leaders, etc.



PROVIDING for the contractor a convenient reference to the latest and best practise in the application of Copper in the roofing and roof-drainage uses of the Everlasting Metal. "Copper Roofing" fills a long-felt need.

Proper methods for the erection of Copper are given. There are a number of full-page illustrations showing the Copper roof applied to various types of buildings. And, wherever it has been thought helpful, the text has been illustrated with figures.

Included are sample specifications covering roofing, flashings, valleys, gutters, leaders, skylights, cornices, etc., and a choice of methods for treating the Copper roof to secure an immediate coloring.

We are anxious that every architect, engineer and contractor interested shall have a copy of "Copper Roofing," and will send a copy promptly on request. There is of course no charge.

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COPPER AND BRASS
RESEARCH ASSOCIATION
25 Broadway, New York

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	April 29	May 29
LONG LEAF YELLOW PINE		
B. and Better Edge Grain Flooring, 2¼" Face	$74.50	$71.50
Dimensions, S1S1E, No. 1 Common, 2x4", 10'	38.00	39.75
Timbers, Merchantable, '05, 12x12", 10 to 20'	51.50	51.50
B. and Better Ceiling, ½x3¼	41.50	44.00
B. and Better Partition ¾"x3¼"	55.00	55.00
B. and Better Finish, 1x4"	62.00	63.00
No. 1 Common Boards, 1x8"	43.00	42.00
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13/16x2½"	$67.00	$58.50
Roofers, 13/16x5½"	29.00	29.00
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3"	$73.00	$73.00
No. 1 Clear V. G. Flooring, 1x4"	71.00	71.00
No. 2 Clear and Better Ceiling, ½x4"	41.00	45.00
No. 2 Clear and Better Novelty Siding, 1x6"	50.00	52.75
No. 2 Clear and Better V. G. Stepping	86.00	86.00
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M	$7.45	$7.40
Washington Perfection Shingles, per M	7.18	7.18
Clear Bevel Siding, ½x6"	43.50	43.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½"	$8.75	$8.25
Dimension, 2x4", 10 to 16'	39.00	34.00
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2x2¼"	$159.00	$151.25
Clear Plain White Oak	115.00	110.00
Clear Plain Red Oak, 13/16"x2¼"	$110.00	$110.00
Clear Maple, 13/16x2¼"	96.50	97.00
(All lumber prices furnished by National Lumber Merchant)		
COMMON BRICK—		
Per M. f. o. b. job	$19.50	$24.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered	$2.40	$2.60
STRUCTURAL STEEL (IRON AGE)—		
Per 100 lb. to large buyers	$1.93	$1.98
CRUSHED STONE (cu. yd.)—		
¾ in.	$2.60	$3.00
1½ in.	2.45	2.80
WALL BOARD—		
Per 1,000 sq. ft. in lots under 1,000 sq. ft.	$50.00	$50.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.	45.00	45.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered	$17.00	$17.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered	19.00	19.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	22.00	22.00
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag	$0.60	.60
Masons, per 50 lb. bag	.45	.45
SAND AND GRAVEL—		
Sand (per cubic yard)	$1.50	$1.50
¾ in. Gravel (per cubic yard)	2.70	3.00
1½ in. Gravel (per cubic yard)	2.70	3.00
FACE BRICK—		
Tapestry (delivered)	$45.00	$45.00
Caledonian (delivered)	40.00	40.00
Smooth Grey (delivered)	50.00	50.00
Fiak Lock f. o. b. factory	32.50	32.50
SHINGLES—		
Asphalt, Single (per square)	$8.50	$7.00
Asphalt, Strip (per square)	6.75	5.25
STAINED WOOD SHINGLES—		
16 in. Extra Clear (per square, delivered)	$11.25	$11.25
18 in. Eureka (per square, delivered)	11.50	11.50
18 in. Perfection (per square, delivered)	12.50	12.50
24 in. Royal (per square, delivered)	12.25	12.25
24 in. Imperial (per square, delivered)	13.00	13.00
VITRIFIED SEWER PIPE—		
4 in. (cents per foot)	$0.10½	$0.10½
6 in. (cents per foot)	.15¾	.15¾
SLATE ROOFING—		
Bangor or Slatington, 8 x 16 in. (per sq. at quarry)	$8.25	$8.40
CORNER BEADS—(Galvanized)—		
Per Foot	$0.03	$0.04
WALL TIES—(Galvanized)—		
Per Thousand	$5.00	$5.00
FLUE LINING—		
8½ x 8½ in., Per Foot	$0.28	$0.28
8½ x 13 in., Per Foot	.40	.40
HOLLOW TILE—		
8 x 12 x 12 in., heavy. Each, delivered	$0.23½	$0.23½
HAIR		
Per Bushel	$0.60	$0.60
PLASTER BOARD—		
32 x 36 x ⅜ in., Each	$0.24	$0.24
MAGNESITE STUCCO—		
Per Ton	$70.00	$70.00
TILE—		
1 in. Square or Hexagon, White, per sq. ft.	$0.25	$0.25
3 x 6 in. White Wall	.60	.60
8 x 8 in. Red Floor	.45	.45

CHICAGO PRICES

	April 29	May 29
YELLOW PINE—		
Boards, 1x8, No. 1 Com.	$38.00	$39.00
Casing and Base, 6-8 in.	64.00	61.00
Ceiling, ½x4, B. and Btr.	43.00	43.00
Dimension No. 1, 2x4, 12 to 14 ft.	31.00	35 00
Drop Siding, 1x6, B. and Btr.	46.50	46.50
Finish, 1x4, B. and Btr.	58.00	61.00
Flooring, B. and Btr. E. G., 1x3	70.00	74.00
Lath, 4 ft., No. 1	6.40	6.75
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12.	41.50	40.00
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear	$94.75	$94.75
Oak Flooring, ⅜x2, Cl. Pl., White	75.00	75.00
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear	$39.25	$39.25
Finish, S2S or S4S, 1x6 to 8 in. clear	84.50	84.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear	$41.75	$44.50
Shingles, Extra Clears, 16 in.	4.65	5.15
COMMON BRICK—		
Per M. f. o. b. job	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$1.97	$1.97
STRUCTURAL STEEL—		
Per 100 lbs. to large buyers	$1.93	$1.98
CRUSHED STONE (cu. yd.)—		
¾ in.	$2.00	$2.00
1½ in.	2.00	2.00
WALL BOARD—		
Per 1,000 sq. ft. in lots 1 M to 2½ M	$45.00	$45.00
Per 1,000 sq. ft. in lots under M	50.00	50.00
SAND AND GRAVEL—		
Sand (per cubic yard)	$2.00	$2.00
¾ in. Gravel (per cubic yard)	2.00	2.00
1½ in. Gravel (per cubic yard)	2.00	2.00

ST. LOUIS PRICES

	April 29	May 29
YELLOW PINE—		
Boards, No. 1 Com., 1x4	$31.50	$35.00
Partition, ¼x3¼, B. and Btr.	52.50	52.50
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	29.00	32.00
Finish, S2S, B. and Btr., 1x4, 6 & 8 ft.	55.00	58.00
Flooring, B. and Btr., E. G., 1x3	67.25	72.00
Flooring, B. and Btr., F. G., 1x3	56.50	59.00
Lath, 4 ft., No. 1	6.00	6.10
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	38.00	39.00
CALIFORNIA REDWOOD—		
Finish, S2S, Cl., 1x6 in.	$84.50	$84.50
Siding, 4 in. Bevel, 10 to 20 ft.	39.25	40.00
8 inch Colonial	66.75	66.75
8 inch Bungalow	68.75	68.75
HARDWOODS—		
Oak Flooring, ¾x1½ and 2 in., Clear Qtr. White	$111.50	$112.00
Maple Flooring, 13/16x2¼ in., Clear	96.75	96.75
RED CEDAR—		
Siding, ½x6, Clear	$41.00	$41.00
Shingles, Clears, Per M	4.61	5.06
COMMON BRICK—		
Per M., f. o. b. job	$16.00	$16.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.10	$2.10
STRUCTURAL STEEL—		
Per 100 pounds to large buyers	$2.02	$2.07
CRUSHED STONE (cu. yd.)—		
¾ in.	$1.83	$1.83
1½ in.	1.83	1.83
WALL BOARD—		
Per 1,000 sq. ft. in lots under M	$50.00	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M	45.00	45.00
SAND AND GRAVEL—		
Sand (per cubic yard)	$1.10	$1.10
¾ in. Gravel (per cubic yard)	1.30	1.30
1½ in. Gravel (per cubic yard)	1.25	1.25

Working Drawings Available to You

This home was designed for a private owner by one of the best residence architects in America.

Sometime ago we published a view of it in one of our books and it attracted so much favorable attention that we had hundreds of requests from all over the country for details and plans.

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When this home was first built the Ideal Brick Hollow Wall was unknown. Its recent development makes possible the building of this Brick home for even less than the above figures. With the Ideal wall you obtain all the advantages of solid masonry construction at a saving of ⅓ in cost.

The Ideal Wall is thoroughly described in "Brick, How to Build and Estimate"—a 72-page manual of vital information for contractors and builders. It contains 30 tables, 9 full page detail drawings and other information which proves of wonderful assistance in estimating costs quickly and accurately. Only 25 cents postpaid.

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The Ideal Brick Hollow Wall is made of standard brick obtainable everywhere

Ideal Brick Hollow Wall

"Brick Homes at the Cost of Frame"

Review of the Building Situation

BUILDING statistics for April just published by F. W. Dodge & Co. show that the volume of contracts awarded are the highest ever recorded. The previous high record was for the month of July, 1919, the total for that month having been $317,698,000, compared with a total of $353,161,900 in April, 1922.

April's figures represented an increase of 20% over the March and an increase of 60% over that of April, 1921.

The first four months of this year have showed a total figure that is just under a billion dollars and is 65% greater than the total for the first four months of last year.

There has been comparatively very little activity in the building of industrial plants since the close of the war, and it is certainly a good healthy sign of the business revival that the contracts awarded for industrial buildings in April total $24,311,700.

A curious fact that we notice here is that the Middle West district which has been rather inactive, is now spending a large sum for industrial buildings.

Residential building, of course, still continues to lead, amounting, in April, to $132,477,800 or 37% of the month's totals.

Business buildings amounting to $58,711,100 is an increase of 17% over that of the March figure and this is also a very good sign of business revival. A good deal of money is being spent on schools and public works.

In the New England District, the total is 60% ahead of March and two and one-half times that of April, 1921.

In the New York District, comprising New York State and Northern New Jersey, the April total was 30% greater than the March figure and two and one-quarter times that of April, 1921!

In the Middle Atlantic States comprising Eastern Pennsylvania, Southern New Jersey and South to South Carolina, the amount is 9% over that of March and is 72% more than that of last year.

Of the total of $132,477,800 to be spent for residential construction, $87,501,700 or nearly two-thirds is under erection in the New England, New York and Middle Atlantic Districts. This shows that the greatest activity in the building of residences is still concentrated in the Northeastern section of our country.

In the city of New York alone, there is now under construction residential buildings which will have room for 50,000 apartments and before the year is over, it is expected that 50,000 more apartments will be provided for.

These figures are exclusive of the one- and two-family houses in New York, of which a great number are being built.

Record of April, 1922. Building Contracts Awarded

Classification of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$14,378,900	$17,113,300	$6,979,700	$7,367,100	$12,143,100	$729,000	$58,711,100
Educational	4,605,600	8,571,900	6,409,500	3,409,000	12,767,400	955,100	36,718,500
Hospitals and Institutions	952,000	1,309,500	460,800	798,100	2,739,000	325,000	6,584,400
Industrial	4,204,400	4,918,100	1,682,300	4,885,500	8,416,900	204,500	24,311,700
Military and Naval	.....	88,500	.....	.....	33,800	.....	122,300
Public Buildings	201,500	155,000	373,900	151,000	495,900	2,400	1,379,700
Public Works and Utilities	3,079,400	28,307,400	9,598,400	6,891,400	25,827,700	1,546,700	75,251,000
Religious and Memorial	1,666,000	1,249,300	1,392,700	1,408,000	2,043,000	529,000	8,288,000
Residential	14,485,400	52,716,900	20,299,400	18,220,000	23,081,500	3,674,600	132,477,800
Social and Recreational	936,400	1,072,000	1,466,600	3,347,900	2,474,500	20,000	9,317,400
Total	$44,509,600	$115,501,900	$48,663,300	$46,478,000	$90,022,800	$7,986,300	$353,161,900

Building Projects Contemplated April, 1922

Classifications of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$7,760,900	$15,196,000	$7,921,900	$9,703,600	$17,241,400	$1,017,500	$58,841,300
Educational	6,753,900	6,711,800	17,814,500	6,170,000	22,347,300	308,100	60,105,600
Hospitals and Institutions	359,000	1,033,000	1,001,000	387,000	2,286,000	175,000	5,241,000
Industrial	2,318,000	13,243,500	1,713,300	8,675,500	8,347,000	160,500	34,457,800
Military and Naval	16,000	.....	428,000	60,000	.....	.....	504,000
Public Buildings	453,000	348,000	241,700	490,000	240,500	549,100	2,322,300
Public Works and Utilities	5,709,800	18,116,500	16,057,200	11,074,700	37,148,400	3,260,800	91,367,400
Religious and Memorial	1,005,500	2,684,000	1,895,000	1,593,000	3,432,500	151,000	10,761,000
Residential	25,562,400	73,388,400	31,926,100	22,566,700	51,738,800	4,839,100	210,021,500
Social and Recreational	1,934,400	5,210,500	903,500	3,937,500	5,193,500	124,500	17,303,900
Total	$51,872,900	$135,931,700	$79,902,200	$64,658,000	$147,975,400	$10,585,600	$490,925,800

Bostwick

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"Diamond A" Expanded Metal
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"Lock" Expanded Metal
"Truss-V-Rib" Re-enforcement
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Corner Bead—Rail
—Standard
—Truss-Wing
Base Bead
Wall Plug
Wall Ties—Y, No. 1, No. 2

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BUILDING MATERIALS



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It toughens and callouses with age. It will not dry out, peel or crack. It is a scientific combination of pure asbestos, gums, waterproof lacquer, and non-volatile oils. It is unaffected by the severest cold or most intense heat—fireproof and rotproof.

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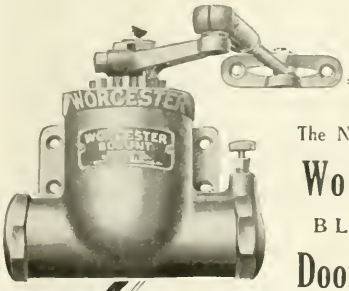


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The Rocbond Company
523 Home Guard Building, Van Wert, Ohio
Van Wert, Ohio—Plants—Cedar Rapids, Ia.



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Six models—a style and size for every door—each combining the SEVEN IMPROVED FEATURES that put Worcester Blount Door Checks in a class by themselves.

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New York Office: 117 Chambers Street

Park Production and Engineering Organization Assure the Utmost in Delivery and Mechanical Service.

Selected List of Manufacturers' Literature

FOR THE SERVICE OF BUILDERS, CONTRACTORS, ARCHITECTS AND ENGINEERS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to Building Age and The Builders' Journal, 920 Broadway, New York, or the manufacturer direct, in which case kindly mention this publication. Either the titles or the numbers may be used in ordering.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

(See also Alphabetical Index, Page 112)

ASBESTOS PRODUCTS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

1. *Ambler Asbestos Shingles.* Catalog. 5½ x 8½ in. 40 pp. Illustrated.
2. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog, 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.
3. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog. 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
4. *Ambler Asbestos Building Lumber.* Catalog, 8½ x 11 in. 32 pp. Illustrated.
5. *Engineers' Data Sheets.* Catalog, 8½ x 11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.

ASBESTOS ROOFING—See also Roofing

ASH HOISTS—See also Hoists

ASH RECEIVERS

Sharp Rotary Ash Receiver Corporation, 396 Bridge St., Springfield, Mass.

7. *Catalog E.* Booklet describing the Sharp Rotary Ash Receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6 x 9¼ in.
8. *Catalog F.* A book for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with tables of dimensions for installation. 8 pp. Ill. 6 x 9¼ in.

BALANCES, SASH

Caldwell Mfg. Company, The, Rochester, N. Y.

9. *Suggestions for the Present-Day Architect.* Booklet. 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.

Pullman Mfg. Co., Rochester, N. Y.

10. *Catalog* describes new form of sash balance that can be removed and inserted without removing sash from window.

BAND SAWS

American Saw Mill Machinery Co., Hackettstown, N. J.

11. *Catalog No. 22* describing a general line of band saws of various sizes.
12. *Technical Data.* Four-page folder, 8½ x 11 in. containing specifications, description, prices and approximate cost of installation. Everything the architect or contractor requires. Proper size for filing.

Crescent Machine Co., Leetonia, Ohio.

241. Descriptive 144-page Catalog.

BAR BENDERS AND CUTTERS

Koehring Company, Milwaukee, Wis.

13. *Four-page folder*, giving illustrations and sizes of Koehring Bar Benders and Cutters.

BEDS

Murphy Door Bed Company, Majestic Bldg., Chicago, Ill.

BOILERS—See Heating Equipment

BOOKS

Architectural House Planning Service Co., 20 So. 18th Street, Philadelphia, Pa.

Arrow Book Company, 347 Fifth Avenue, New York City.

U P. C. Book Co., 243 West 39th Street, New York City.

BLUE PRINTS

Peerless Blue Print Co., 347 Fifth Avenue, New York City.

BRICK

American Face Brick Association, 110 South Dearborn St., Chicago, Ill.

15. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Sent free.
16. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions and illustrated and described. Size 8½ x 11 in. 116 pp. Price $1.00.
17. *The Home of Beauty.* A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8 x 10 in. 72 pp. Price 50 cents.
18. *Architectural Details in Brickwork.* Three series of beautiful half-tone prints of brickwork detail, contained in closed folders suitable for standard vertical letter file. The three series contain 124 prints in all. Size 8½ x 11 in. Price $1.50 per set.

Common Brick Manufacturers' Association of America, 1309 Schofield Bldg., Cleveland, Ohio.

19. *Brick—How to Build and Estimate.* 3rd edition, 32nd thousand, a manual of solid brick and Ideal wall construction. Contains data on the strength of brickwork, on mortars, bonds and joints and equipment, and contains complete estimating tables for quantities of brick, mortar, material and approximate mechanics' time for various thicknesses and square foot areas of solid and Ideal wall. 8½ x 11 in. 72 pp. Price 25 cents.
20. *Brick for the Average Man's Home.* Book. 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00.

Fiske & Company, Boston, Mass.

245. Tapestry brick, other grades of front brick. Manufacturers of "Fisklock" Brick.

BUILDING CONSTRUCTION—See also Garage Construction

National Manufacturing Co., Sterling, Ill.

Truscon Steel Company, Youngstown, Ohio.

21. *Truscon Floortype Construction.* Form D-352. Contains complete data and illustrations of Floortype installations. 16 pp. Ill. 8½ x 11 pp.
22. *Truscon Standard Buildings.* Form D-398. Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8½ x 11 in.
23. *Truscon Building Products.* Form D-376. Contains a brief description of each of the Truscon Products. 112 pp. Ill. 8½ x 11 in.
24. *Modern School Construction.* Form D-395. Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill. 8½ x 11 in.

BUILDING HARDWARE—See Hardware

BUILDING STONE—See Stone, Building

BUILT-IN CLOTHES HANGERS

Knape & Vogt, Grand Rapids, Mich.

BUNGALOW AND SMALL HOUSE PLANS

American Face Brick Association, 110 South Dearborn St., Chicago, Ill.

25. *Four booklets* of small houses from 3 to 8 rooms, containing 98 reversible designs. (1) 3-4 rooms, (2) 5 rooms, (3) 6 rooms, (4) 7-8 rooms; size 8½ x 11 in. Each booklet 25 cents, set $1.

Architectural House Planning Service Company, 20 South 18th Street, Philadelphia, Pa.

CANVAS—See Roofing Materials

CASEMENTS—See Doors and Windows

CAULKING AND GLAZING COMPOUND

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.

246. Illustrated catalog sent on request.

CEILINGS, METAL

The Edwards Manufacturing Company, Cincinnati, O.

33. *Pamphlet* of 32 pages, describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 in.

Keighley Mfg. Co., 124 Third Avenue, Pittsburgh, Pa.

CEMENT

Alpha Portland Cement Company, Easton, Pa.

34. *Alpha Cement—How to Use It.* Handbook 6 x 9 in. 96 pp. Illustrated. A practical handbook on popular forms of concrete construction, including form work, proper proportions in mixing, waterproofing, colored concrete, etc.
35. *Alpha Service Sheets and Bulletins.* Special suggestions on the construction of Industrial Housing, Garages, Inclosure Walls, Steps, Sidewalks, Barns, Silos, Farm Buildings, etc.
36. *Alpha Aids.* A bi-monthly magazine for those who buy, sell or use Portland Cement, sent complimentary to approved names.

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

37. *The Atlas Book on Concrete Construction.* A text book written for the average builder in concrete and from the practical rather than from the technical standpoint. Treats on both plain and reinforced concrete. 144 pp. 4½ x 7 in. Cloth bound. Price $2.00.
30. *Set of Blue Prints.* Drawings showing how to apply Portland Cement stucco to the different standard types of wall construction. Appended are tables of the quantities of cement, and sand required to cover a given wall surface. Size 8½ x 11.
31. *Concrete on the Farm.* The most comprehensive book of its kind. Practical and thoroughly reliable instructions, with plans and pictures of all possible farm structures for which concrete can be used. Complete directions in practical terms for selection of aggregates and the mixing and placing of concrete.
32. *Other Publications.* The Atlas Portland Cement Company has numerous other publications, covering nearly every phase of concrete construction. Their Service Department will give sound advice on any phase of concrete construction to anyone



YOUR REPUTATION

as a contractor, builder or dealer is in every square of roofing you sell, or every roof you lay. You are selling your customers *permanent shelter*—backed by your guarantee of honest materials and good workmanship.

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The extra thickness of these shingles adds to the beauty of a roof, as well as to its permanence. Yet they cost less than a third more than standard asphalt shingles.



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The Richardson Company
Lockland, Cincinnati, Ohio

RICHARDSON *Product*

FLEX-A-TILE HOUSE TOPS 1868

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 68*

Kochring Company, Milwaukee, Wis.
38. *Concrete—Its Manufacture and Use.* Book. 4½ x 7 in. Illustrated. 207 pp. Comprehensive discussion from the practical standpoint of concrete.
Lehigh Portland Cement Co., Allentown, Pa.
40. *The Expense-Proof Farm.* Book of 96 pp. Illustrated. Showing methods of constructing various buildings, fence posts, water troughs, etc., used about the farm.

CHAINS
Bridgeport Chain Co., Bridgeport, Conn.
29. *Catalog No. 14.* Contains 64 pp. Illustrated, of different chains that can be used in all parts of building construction.

CLAMPS
James L. Taylor Mfg. Co., Poughkeepsie, N. Y.

COLUMN AND BEAM COVERING
United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
39. *32-page booklet,* 8½ x 11. Pyrobar Tile.

COLUMNS
Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.
233. *Catalog No. 147,* 48 pages, illustrated. 7¼x10 in. Illustrating the Koll's Patent Lock-Joint Wood Columns.

CONCRETE APPLIANCES
Universal Cement Mould Co., No. Milwaukee, Wis.
41. *Illustrated Folder* describing mold for building hollow concrete walls for homes, garages, barns, silos, etc.
Van Guilder Double Wall Co., 77 South Avenue, Rochester, N. Y.
42. *A Catalog* describing the Van Guilder system of portable forms for the building of hollow concrete walls on the thermos bottle idea for the erection of homes, ice houses, barns, silos, etc. Walls are dry, as there is continuous air space around entire building.

CONCRETE MACHINERY
A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
43. *Descriptive Illustrated Circular* of Magic Concrete Mixer.
The American Cement Machine Co., Inc., Keokuk, Iowa.
Badger Concrete Mixer Co., Majestic Bldg., Milwaukee, Wis.
Concrete Equipment Co., 535 Ottawa Street, Holland, Mich.
Concrete Block Machine & Mold Co., 114 S. 2nd Street, St. Louis, Mo.
253. *Catalogue No. 38.* Describes Building Block Machines. It is a 40-page book, 6 x 10 in.
254. *Catalogue No. 5.* This is a new catalogue describing the Adjustable Steel Culvert Forms. 8-page book 6 x 10 in.
255. *Catalogue No. 11.* This is a new catalogue describing the new Steel Burial Vault Molds. It is 8 pages, 6 x 10 in.
C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
Ideal Concrete Machinery Co., 1334 Monmouth Street, Cincinnati, Ohio.
Jaeger Machine Co., 216 Dublin Avenue, Columbus, Ohio.
Koehring Co., Milwaukee, Wis.
46. *Koehring Construction Mixers.* Booklet. 7¾ x 10½ in. Illustrated. 96 pp. Complete information on construction type concrete mixers.
47. *Koehring Dandie Mixer.* Booklet. 6 x 9 in. Illustrated. 24 pp. Illustrating and describing Koehring line of Dandie light mixers.
Little Whirlwind Mixer Co., 438 Gould Street, La Crosse, Wis.
Republic Iron Works, Box 602, Tecumseh, Mich.
Standard Scale & Supply Co., 1631 Liberty Avenue, Pittsburgh, Pa.

CONCRETE MARBLE
Art Stone Co., Waynesboro, Pa.
45. *Descriptive Circulars* with illustrations of different marbles in colors. Sent free to any interested party.

CONSTRUCTION, FIREPROOF
National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
226. *Standard Fire Proofing Bulletin* 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fireproof floor construction.
National Pressed Steel Co., Massilon, Ohio.
United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
48. *Pyrobar Gypsum Tile.* Booklet. 8½ x 11 in. 32 pp. Illustrated. Detail and specifications for fireproof partitions.
49. *Bulletins,* 8½ x 11 in. Containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

CONTRACT AND ESTIMATE BLANKS
L. Fink & Sons Printing Co., Laurel Springs, N. J.
166. *Catalog and Samples* of contract sheets, estimate blanks, job tickets, time sheets, wage receipts, etc., with prices.

DAMPERS AND ASH DUMPS (Fireplace)
The Danley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.
Stover Mfg. & Engine Co., 747 Lake Street, Freeport, Ill.

DAMP-PROOFING
Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
Cortright Metal Roofing Co., Philadelphia, Pa.
Illinois Zinc Co., 280 Broadway, New York.
National Sheet Metal Roofing Co., 339 Grand Street, Jersey City, N. J.
Rocbond Co., Van Wert, Ohio.
F. C. Sheldon Slate Co., Granville, N. Y.

DOOR CHECKS
Park Manufacturing Co., Worcester, Mass.
50. *Catalog* contains description of six models of the new improved Worcester-Blount Door Check.

DOORS AND WINDOWS
The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.
247. BOCA steel sash. (E-22). A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages.
Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.
Hess Warming & Ventilating Co., 1201 Tacoma Bldg., Chicago, Ill.
Henry Hope & Sons, 103 Park Ave., New York.
51. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¾ x 18½ in. 32 pp.
Truscon Steel Company, Youngstown, Ohio.
52. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.
53. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill. 8½ x 11 in.

DOOR AND WINDOW FRAMES
Andersen Lumber Company, South Stillwater, Minn.
55. *General Catalog* for architects, contractors, engineers, carpenters or builders. Describes and illustrates fully Andersen Standard White Pine Window, Cellar Frames, Sash Frames and Door Frames. Gives details of construction, variety of sizes and uses for ordinary as well as special construction, and method of assembly. Size 7¾ x 10¾, 24 pages.
56. *Better Frames for Less Money* for consumers. Interesting folder showing advantages of Andersen Standard White Pine Frames. Uses, sizes and details of construction.

DRAFTING MATERIALS
A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
Keuffel & Esser Co., Hoboken, N. J.
Peerless Blue Print Co., 347 Fifth Avenue, New York City.
Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.

DUMBWAITERS
Kimball Bros. Co., 1106 Ninth Street, Council Bluff, Iowa.
Sedgwick Machine Works, 156 W. 15th Street, New York.
57. High grade Hand Power Elevators and Dumbwaiters for All Purposes. Illustrated catalog, 52 pages; dumbwaiter service sheet, and pamphlets descriptive of many special types of outfits.

ELEVATORS
Kimball Brothers Company, Council Bluffs, Iowa.
58. *Kimball Elevators.* An illustrated catalog of hand power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7¾ x 10½ in.
Richards-Wilcox Mfg. Co., Aurora, Ill.
59. *"Ideal" Elevator Door Equipment.* Catalog showing elevator door hangers for one, two and three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.
Sedgwick Machine Works, 156 West 15th Street, New York.

FACTORY EQUIPMENT
The Edwards Mfg. Co., Cincinnati, Ohio.
60. *Edwards' Steel Equipment.* Illustrated catalog. Showing steel lockers and shelving for factories, offices, stores, schools and hospitals, together with illustrations and description of "Edmanco" steel office furniture and filing cabinets. Size 8 x 11 in. 32 pp.

FIREPLACES AND MANTELS
Apex Fireplace Co., Urbana, Ill.
Stover Mfg. & Engine Co., 747 Lake Street, Freeport, Ill.
Strait & Richards, Inc., Newark, N. J.
62. *Catalog* describing fireplaces, electric and gas logs, heating supplies, heaters, etc.

FLOOR HARDENERS
Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
61. *Agatex and Its Performances.* Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FLOORING, LUMBER
The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
63. *The Perfect Floor.* Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5½ x 7½ in.
Oak Flooring Manufacturers Association, 1014 Ashland Block, Chicago, Ill.
64. *Modern Oak Floors.* Booklet. 6½ x 9¼. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
65. *Oak Flooring, How and When to Use It.* Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.
Pacific Lumber Co., 2070 McCormick Bldg., Chicago, Ill.
United States Gypsum Company, 205 W. Monroe Street, Chicago Ill.
66. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins, 8½ x 11. Pyrofill.
Wood Mosaic Co., New Albany, Ind.
227. *Catalogue* of wood-carpet, strips, plain and ornamental parquetry, tongue and groove flooring in natural wood colors.

FLOORING, COMPOSITION
Everlasbestos Flooring Co., Rochester, N. Y.
National Kellastone Co., 155 East Superior Street, Chicago, Ill.

FLOOR SURFACING
Amer. Floor Surfacing Machine Co., 521 So. St. Clair Street, Toledo, Ohio.
Waywell Chappell & Co., 137 No. Jackson Street, Waukegan, Ill.
M. L. Schleuter, 223 W. Illinois Street, Chicago, Ill.

FLOOR VOIDS FOR USE IN CONCRETE
United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.
67. *Loose-leaf Bulletins.* 8½ x 11. Pyrobar Gypsum Floor Tile.

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Some wallboards may have one good feature—some, another. Sheetrock effectively combines all the qualities you want in a dependable wall and ceiling material.

Both in new construction and in remodeling and repairs, Sheetrock makes an attractive, high grade job of which you can always be proud.

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It Stops Fire. Being made from gypsum rock, Sheetrock will not burn. It has been fire-tested for fire-resistiveness and approved by the Underwriters' Laboratories, Inc.

Sheetrock Won't Warp. It will not shrink, warp or buckle. It remains firm and flat year after year. Sheetrock can be decorated with wallpaper, paint or panels.

Keeps Rooms Comfortable. As the gypsum rock from which it is made is an efficient non-conductor of heat and cold, Sheetrock helps keep rooms comfortable the year 'round. Sheetrock also deadens sound.

Sheetrock Is Economical. Because it is low in first cost and will outlast the building in which it is erected, and because of the savings it effects in construction labor, Sheetrock provides smooth, solid walls at a minimum cost.



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MINES AND MILLS: Oakfield, N.Y., Plasterco, Va., Cleveland, Ohio, Gypsum, Ohio, Genoa, Ohio, Detroit, Mich., Alabaster, Mich., Grand Rapids, Mich., Milwaukee, Wis., Fort Dodge, Ia., Blue Rapids, Kas., Southard, Okla., Eldorado, Okla., Piedmont, S.D., Loveland, Colo., Denver, Colo., Arden, Nev., Amboy, California

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Address .....

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 70*

GARAGE CONSTRUCTION
National Mfg. Co., Sterling, Ill.
248. Catalog of Garage Hardware.

GARBAGE DESTROYERS
Kerner Incinerator Company, 1027 Chestnut Street, Milwaukee, Wis.
68. *The Sanitary Elimination of Household Waste.* M-3 Folder. Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. 4 x 9 in.

GARBAGE RECEIVERS
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

GLASS
American Window Glass Co., Pittsburg, Pa.
69. Send for circular describing different varieties of window glass and how to select the proper kind.
American Three-Way Luxfer Prism Co., Cicero (Chicago), Ill.
70. Write for details and prices of glass prisms that will project daylight into dark interiors.
71. Other literature with reference to apartment house installations.

GYPSUM
U. S. Gypsum Company, 205 W. Monroe Street, Chicago, Ill.

HARDWARE
Bridgeport Brass Co., Bridgeport, Conn.
Caldwell Mfg. Co., 5 Jonea Street, Rochester, N. Y.
Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.
Griffin Mfg. Co., Erie, Pa.
Hesa Warming & Ventilating Co., 1204 Tacoma Building, Chicago, Ill.
240. *24-Page Illustrated Catalog.* 4x6 in. Describing the Sanitary Medicine Cabinet, Lockers and Lavatory Mirrors.
H. B. Ives Co., New Haven, Conn.
The Kawneer Co., Niles, Mich.
72. *Kawneer, Simplex Window Fixtures.* Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½ x 10¾ in. 16 pp.
Knapp & Vogt Mfg. Co., Grand Rapids, Mich.
73. Garment Hangers—Send for illustrated booklet.
F. E. Myers & Bro. Co., Ashland, Ohio.
National Mfg. Co., Sterling, Ill.
Richards-Wilcox Mfg. Co., Aurora, Ill.
75. *Modern Hardware for Your Home.* Catalog of hangers for vanishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Slidetite" garage door hardware. 24 pp. Illustrated. 8½ x 11 in.
Sargent & Company, New Haven, Conn.
The Stanley Works, New Britain, Conn.
76. *Wrought Hardware.* New 1921 Catalog. This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 376 pp. Illustrated. 6½ x 9¼ in.
77. *Garage Hardware.* Booklet, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustration and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.
78. *Eight Garages and Their Stanley Hardware.* Booklet. Plans, drawings and complete hardware specifications. Size 5 x 7 in. 32 pp.
79. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in. 32 pp
Upson Company, Lockport, New York.

HEATING EQUIPMENT
Co-operative Foundry Co., Rochester, N. Y.
230. Manufacturers of pipeless furnace.
The Farquhar Furnace Company, Wilmington, Ohio.
80. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Illustrated. 4¼ x 9¼ in.
81. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Illustrated. 8½ x 11 in.
Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.
Hesa Warming & Ventilating Co., 1205D Tacoma Building, Chicago, Ill.
82. *Modern Furnace Heating.* Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.
Holland Furnace Co., Holland, Mich.
230. *24-Page Illustrated Catalog.* Containing some sound advice on the heater and some miscellaneous points.
Kelsey Heating Company, James Street, Syracuse, N. Y.
83. *Booklet No. 5.* 4 x 9. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacties, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools
84. *Monroe Pipeless Booklet.* 4½ x 8 in. 20 pp. Illustrated.
85. *Monroe Tubular Heater.* Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
86. *Syracuse Pipeless Booklet.* 4½ x 8 in. 12 pp. Illustrated. General Booklet giving sizes and capacities.
87. *Valves, Syphons and Traps.* A series of pamphlets to enclose in envelopes, describing the well known Thermostatic Return Line Valves and other heating equipment specialties made by this company
Sill Stove Works, Rochester, N. Y.
Strait & Richards, Inc., Newark, N. J.
88. *Catalog* describing fireplaces, electric and gas logs, heaters, etc.

HOISTS—See Elevators
American Saw Mill Machinery Co., Hackettstown, N. J.
89. *Bulletin No.* 10 describing several kinds of builders' hoists.
C., H., and E. Mfg. Co., Milwaukee, Wis.
90. *Bulletin No. 3.* Hoists and Mortar Mixers.

HOLLOW TILE
Fiske & Company, Boston, Mass.
National Fire Proofing Co., Pittsburgh, Pa.

INCINERATORS—See Garbage Destroyers

INSULATION
Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
92. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.
Brown Co., Portland, Me.
93. Send for samples of "Bermico" Sheathing paper—different weights for all purposes of insulation.
Samuel Cabot, Inc., 141 Milk St., Boston, Mass.
249. Cabot's Quilt. Catalog containing drawings and description.
United States Mineral Wool Co., 280 Madison Avenue, New York, N. Y.
94. *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼ x 6¾ in. 24 pp

JOISTS AND STUDS, PRESSED STEEL
General Fireproofing Co., Youngstown, Ohio.
National Pressed Steel Co., Massillon, Ohio.
96. *Descriptive 4-page folder* on metal lumber for building construction.
Truscon Steel Company, Youngstown, Ohio.
95. *Truscon Steel Joists.* Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

LATH, METAL AND REINFORCING
Buffalo Wire Works Co., Inc., 446 Terrace, Buffalo, N. Y.
250. Write for Booklet 61-F on wire lathing.
General Fireproofing Co., Youngstown, Ohio.
97. *Catalog* describes Herringbone Rigid Metal Lath, how it is applied and used, with detailed drawings, specifications, etc. 32 pp.
National Pressed Steel Co., Massillon, Ohio.
Truscon Steel Co., Youngstown, Ohio.
99. *Hy-Rib and Metal Lath.* 18th Edition. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

LEVELS
A. S. Aloe Co., 513 Olive Street, St. Louis, Mo.
L. Beckman Co., 1004 Jackson Street, Toledo, Ohio.
Keuffel & Esser Co., Hoboken, N. J.
Warren-Knight Company, 136 North 12th St., Philadelphia, Pa.
100. *"Sterling" Levels and Transits.* 32 pp. illustrated catalog. Description, specifications and structural advantages required in modern practice for establishing lines, levels, angles, etc. Vest Pocket Manual of adjustments
David White Co., 907 Chestnut Street, Milwaukee, Wis.

LIGHTING
American Three-Way Prism Co., 1307 South 55 Court, Cicero, Ill.
98. *Descriptive Circular* on the use of prisms for directing light to dark corners.

LIGHTNING RODS
E. G. Washburne Co., 207 Fulton Street, New York.
232. *Descriptive Catalogue in Colors.* Showing different designs of weather vanes, lightning rods, ventilators, etc.

LIGHTING SPECIALTIES
I. P. Frink, Inc., 24th Street and 10th Avenue, New York, N. Y.
250. *Lighting Service for Hospitals.* A booklet illustrated with photographs and drawings, showing the types of lights for use in hospitals, as operating table reflectors, linolite and multilite concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses. Size 7 x 10 in. 12 pp.
251. *Frink Reflectors and Lighting Specialties for Stores.* Catalog No. 424. A catalog containing a description of the Frink Lighting System for Stores; the Synthetic System of Window Illumination; and a number of appliances to produce the most effective lighting of displayed objects. 20 pp. Illustrated. 8 x 11 in.
252. *Frink Lighting Service for Banks and Insurance Companies.* Reflectors. Catalog No. 425. A very interesting treatise on the lighting of offices; with details of illustrations and description of lamps and reflectors. Contains a list covering several pages, of banks using Frink Desk and Screen Fixtures. 30 pp. Illustrated. 8¼ x 11 in.

LUMBER
Arkansas Soft Pine Bureau, 802 Boyle Building, Little Rock, Ark.
101. *Arkansas Soft Pine Handbook.* Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Molding Designs.
102. *The Home You Long For.* Booklet. 8¼ x 11 in. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.
Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
104. *The Post Everlasting.* Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.
228. *Poles That Resist Decay.* Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.

Safely from Ridge to Ground



The **roof** catches the rain or snow, but it is the valleys, gutters and leaders that carry the rain or melted snow to the ground.

If valleys or gutters **leak,** due to rust or corrosion, decorations and furnishings are at the mercy of the elements, **no matter if the roof proper is in perfect condition!**

If Valleys and Gutters Are

TARGET-AND-ARROW ROOFING TIN

(Prior to 1905 called Taylor's "Old Style")

decorations and furnishings are absolutely safe, for TARGET-AND-ARROW is made to **last,** and while its first cost is slightly more than ordinary roofing tin, it will save many, many times the original investment by preventing costly damage to the favorite furniture and fittings.

Send for "THE ACHILLES HEELS OF A BUILDING," a graphic chart showing where gutters, valleys, flashings and other vital spots occur in the roof of a building and explaining how and why "Target-and-Arrow" assures permanent protection to these important places

N. & G. TAYLOR COMPANY
304 CHESTNUT ST. PHILADELPHIA, PA.

Headquarters for good roofing tin since 1810

Look for this Trade ➙ ◎ *Mark on every Sheet*

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 72*

105. *"From Tree to Trade."* a 48-page illustrated description of the manufacture of lumber from tree to use. Describes methods of logging, construction, etc.

Pacific Lumber Company of Illinois, The, 1105 Lumber Exchange Building, Chicago, Ill.

106. *Engineering Digest.* Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipes, Outbuildings, Irrigation Flumes, Drainage Boxes, Greenhouses, etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.

Southern Cypress Mfrs. Assn., 1227 Poydras Bldg., New Orleans, La.

107. *Many interesting booklets* on the use of Cypress for all purposes.

Weyerhaeuser Forest Products, St. Paul, Minn.

LUMBER, ASBESTOS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

108. *Ambler Asbestos Building Lumber.* Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½ x 11 in. 32 pp.

MARBLE, ARTIFICIAL

Art Stone Co., Waynesboro, Pa.

METAL LATH—See Lath, Metal and Reinforcing

METALS AND METAL BUILDING SPECIALTIES

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.

111. *Reference Book.* Pocket Edition. 2½ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.

113. *Apollo and Apollo-Keystone Galvanized Sheets.* Catalog. 8½ x 11 in. 20 pp. Illustrated.

114. *Research in the Corrosion Resistance of Copper Steel.* Booklet. 8½x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.

115. *Facts Simply and Briefly Told.* Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.

116. *Block Sheets and Special Sheets.* Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc.
Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

The Donley Bros. Co., 7400 East 74th Street, Cleveland, Ohio.

237. *28-Page Illustrated Catalog* on "Donley Devices and Building Specialities." 6x9 in.

N. & G. Taylor Co., Philadelphia, Pa.

117. *Booklet and Detail Sheet of Tin Roofing.* See Roofing.

METAL TRIM—See Doors, Windows and Metal

MILLWORK—See also Lumber—Building Construction—Doors and Windows

MORTAR—See also Cement

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.

118. *Clinton Mortar Colors.* Booklet. 3½ x 6⅛ in. 8pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

PACKAGE RECEIVER

The Donley Bros., 3700 East 74th Street, Cleveland, Ohio.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Samuel Cabot, Inc., Mfg. Chemists, 141 Milk Street, Boston, Mass.

S. C. Johnson & Son, Racine, Wis.

122. *The Proper Treatment for Floors, Woodwork and Furniture.* Booklet. 6¼ x 8⅜ in. 32 pp. Illustrated in color. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.

123. *Portfolio of Wood Panels.* 5½ x 10¾ in. 14 pp. A portfolio containing actual panels of finished woods. Also contains valuable information on finishing and re-finishing floors and woodwork.

National Lead Co., 111 Broadway, New York City.

124. Handy Book on Painting. Book 5½x3¼ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal, etc., both interior and exterior.

Eugene E. Nice & Company, 268 South Second Street, Philadelphia, Pa.

125. *Price List "C01"* contains descriptions of various paints, japans, varnishes, glue, stains, varnish remover, etc. 48 pp. Pocket size. Sent to any address.

Ripolin Co., The, Cleveland, Ohio.

256. *Ripolin Specification Book,* 8x10¼ in., 12 pp. Complete architectural specifications and general instructions for the application of Ripolin, the original Holland Enamel Paint. Directions for the proper finishing of wood, metal, plaster, concrete, brick and other surfaces, both interior and exterior, are included in this Specification Book.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

131. *Spread the Sunshine Inside.* Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories.

PARTITION STEEL

Empire Steel Partition Co., College Point, Long Island, N. Y.

PARTITION SYSTEM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

133. *Loose leaf bulletins,* 8½ x 11 in. Jester-Sackett, consists of plaster board applied to metal channels with special clip, ready for plastering.

PARTITION TILE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

134. *Fireproof.* 32-page booklet, 8½ x 11 in., including description, specifications, and working details of Pyrobar partition tile.

PLASTER—(Interior)

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

PLASTER BOARD

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

135. *Pamphlets,* describes Sackett Plaster Board used instead of wood or metal lath.

PERGOLAS

Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.

235. *Album No. 33.* 7½x10½ in. 42 pages of illustrated literature regarding the various types of Pergolas.

PLASTER, INTERIOR

National Kellastone Co., 155 East Superior Street, Chicago, Ill.

PLUMBING SUPPLIES

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

Hess Warming & Ventilating Co., 1205D Tacoma Building, Chicago, Ill.

136. *Hess Sanitary Steel Medicine Cabinets.* Booklet. 4 x 6 in. 16 pp. Illustrated.

B. Karol & Sons Co. 806 So. Kedzie Avenue, Chicago, Ill.

Trenton Potteries Co., Trenton, N. J.

257. *Our New Catalog Shows These Details.* If our new Catalog R is not on your desk, by all means send for a copy. Architects who have seen it quite generally pronounce it the most completely comprehensive catalog of plumbing fixtures in their experience. Not only are complete specifications given, but the detail drawings are invaluable in showing exactly how and when a certain type should be used.

PUMPS

C. H. & E. Mfg. Co., Milwaukee, Wis.

251. Bulletin No. 2. Pumps.

The F. E. Myers & Bro. Co., Ashland, Ohio.

137. *General Catalog.* 6 x 9 in. 392 pages. Shows complete line of Myers Products—Pumps for Every Purpose, Hay Tools, Door Hangers, Store Ladders, etc. Of particular interest to hardware and implement dealers; plumbers, architects, contractors and builders; mill, mine, factory and railway superintendents and purchasing agents; highway contractors and builders.

138. *Catalogs.* 6 x 9 in. Devoted to separate lines: No. 55, Pump—Hand and Power Pumps; No. PP-55, Power Pumps; No. HT-55, Hay Tools, Door Hangers and Store Ladders; No. HP-22, Hydro-Pneumatic Pumps, Electric House Pumps, Direct Water Systems; No. SOP-21, Self-Oiling Power Pumps; No. MC-21, Cylinders and Working Barrels; No. SP-22, Spray Pumps and Spraying Accessories. All catalogs fully illustrated.

REFRIGERATION

McCray Refrigerator Co., 2264 Lake Street, Kendallville, Ind.

ROOF DECKS

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

139. *Loose leaf bulletins.* 8½ x 11. Describing Pyrobar Roof Tile, which is laid directly on purlins or tee irons, joints grouted, and is then ready for roof covering.

ROOFING MATERIALS

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.

American Sheet & Tin Plate Company, Pittsburgh, Pa.

140. *"Better Buildings."* Catalog. 8½ x 11. 32 pp. Describing Corrugated and Formed Sheet Steel Roofing and Siding Products—Black, Painted and Galvanized; together with directions for application of various patterns of Sheet Steel Roofing in various types of construction.

112. *Copper—Its Effect Upon Steel for Roofing Tin.* Catalog 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

141. *Specifications and Price List.* Descriptive booklet. Details of Ambler Asbestos Cement Roofing Slates, "Century" Asbestos Shingles and Asbestos Corrugated Sheathings. Tables and drawings. Size 6 x 9 in. 44 pp.

142. *Ambler Asbestos Corrugated Roofing.* Catalog gives complete data for specifying, drawings, methods of application, tables, etc. Size 8½ x 11 in. 20 pp.

Wm. L. Barrell Co., of N. Y., Inc., 50 Leonard Street, New York.

143. *Prepared Canvas for Roofing.* Samples can be obtained on application. A canvas for every use.

John Boyle & Co., Inc., 112-114 Duane Street, New York, N. Y.

145. *Boyle's Bayonne Roof and Deck Cloth.* List B 93. A prepared roofing canvas guaranteed waterproof for decks and the roofs and floors of piazzas, sun-parlors, sleeping porches, etc.



Roof stained with Cabot's Creosote Stains. Walls finished with Old Virginia White. Lined with Cabot's Quilt for warmth.
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For Roofs, Siding, Timbers and all Other Outside Woodwork

Cabot's Creosote Stains

They have proved their merit in every climate for nearly forty years. The colors are soft, rich and harmonious, the Creosote penetrates the wood, preserves it, and makes it less inflammable. Shingles make the warmest and cheapest outside finish, and a shingled house stained with Cabot's Stains is the ideal, cozy American country home.

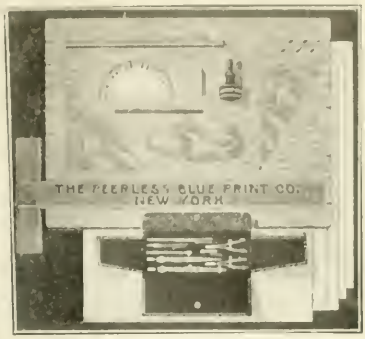
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A scientific heat insulator and sound-deadener that makes houses warmer in winter and cooler in summer and deadens sounds in floors and partitions. Not a mere felt or paper, but a non-conducting mat that is about thirty times warmer than common papers.

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Morocco pocket case of fine Nickel Silver Instruments containing 5½-inch compass, with pen, pencil, and needle points, and lengthening bar;
5 inch Spacing Dividers;
4½-inch Ruling Pen.
Bow Pen
Bow-Pencil;
Pencil case; and adjusting key;
Drawing Board, 16½ in. x 22½ in., with expansion cleats and grooved back;
6-inch Protractor;
7-inch 45° Transparent Celluloid Triangle;
8 inch 30° x 60° Transparent Celluloid Triangle
12 inch Triangular Boxwood Scale;
Transparent Celluloid Irregular Curve;
Six Thumbtacks;
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¾-ounce bottle Waterproof Drawing Ink,
Pencil and Ink Eraser,
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22½-inch Mahogany, Maple-Lined T Square

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What about the attic space?

Is it used to advantage or is it allowed to go to waste because you have not been able to provide the necessary space in the room below?

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You should know more about The Bessler Movable Stairway—the logical solution to this problem.

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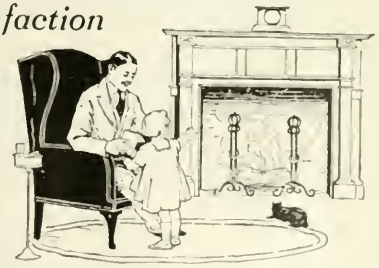
It has merit—strength, ease of operation, appearance and convenience.

Shouldn't you really have our catalogue giving sizes of stairs, opening widths, ceiling heights, prices, etc.? You owe it to yourself to keep posted on this "modern way up"—The Bessler Movable Stairway. Write for your copy of our catalog today.

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Akron Ohio

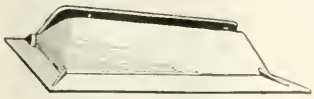
Fireside Satisfaction

and what it calls for



IT calls for an easy chair, a pipe, and a book; for a hearth rug and pussy cat; for a tiny daughter who begs for a story. It calls for a fire that really burns—a bright, clean, warm, smokeless blaze that needs little attention or fuel.

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BUILDING SPECIALTIES
3700 EAST 74TH ST. CLEVELAND

METAL COLUMNS AND STRUCTURAL SPECIALTIES

DONLEY DEVICES *Modernize the Home*

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 74*

Copper & Brass Research Association, 25 Broadway, New York City.

Cortright Metal Roofing Co., Philadelphia, Pa.

236. Four-page circular describing the various shingles.

Creo-Dipt Company, 1025 Oliver Street, North Tonawanda, N. Y.

153. *Standard Stained Shingle.* Samples of different kinds mailed on request.

154. *Architectural Service Sheets.* 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.

Edwards Mfg. Co., 423 Eggleston Avenue, Cincinnati, Ohio.

C. G. Hussey & Co., Pittsburgh, Pa.

227. *Copper Roofing and Flashings.* Book No. 6. 34 pp.

Illinois Zinc Company, 280 Broadway, New York, N. Y.

155. *Pure Rolled Zinc.* (Corrugated and Plain Sheets.) Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Facts regarding adaptability of zinc for roofing. Specifications of corrugated zinc sheets. Weights per square. Comparative gauge lists.

156. *The Roof That's Always New.* Booklet. 3¾ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley, ridge and hip piece.

National Sheet Metal Roofing Co., 339 Grand St., Jersey City, N. J.

159. *Manufacturers of Metal Shingles* in various designs, both in painted tin or galvanized iron. Samples sent to interested parties.

Richardson Co., Lockland, Cincinnati, Ohio.

F. C. Sheldon Slate Co., Granville, N. Y.

N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.

160. *Selling Arguments for Tin Roofing.* Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

161. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins. 8½ x 11. Pyrofill.

Vulcanite Roofing Co., Buffalo, N. Y.

RULES

A. S. Aloe, St. Louis, Mo.

Keuffel & Esser, Hoboken, N. J.

Sargent & Co., New Haven, Conn.

Stanley Rule & Level Co., New Britain, Conn.

SASH CHAINS, HOOKS AND ATTACHMENTS

The Bridgeport Chain Co., Bridgeport, Conn.

209. *An Interesting Catalog.* Describing furniture and coil springs. Also wire specialties and various kinds of chains.

SASH CORD

Samson Cordage Works, Boston, Mass.

SAW MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.

162. *Catalog No. 21,* describing Circular Saws of all sizes.

163. *General Catalog No. 22* and *special Bulletin No. 77,* describing sawing machinery for use on the job in the shop.

W. F. & John Barnes Co., 71 Rudy Street, Rockford, Ill.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.

164. *Bulletin No. 1, Saw Rigs.*

Crescent Machine Co., 206 Main Street, Leetonia, Ohio.

Huther Bros. Saw Mfg. Co., Rochester, N. Y.

C. E. Jennings Co., 321 Winthrop Avenue, New Haven, Conn.

Parks Ball Bearing Machine Co., Station A, Cincinnati, Ohio.

Sidney Machine Tool Co., Sidney, Ohio.

SCREENS

American Wire Fabrics Company, 208 South La Salle Street, Chicago, Ill.

165. *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enameled, galvanized, galvannid, American bronze. 30 pp. Illustrated. 3½ x 6¼ in.

SEWAGE DISPOSAL

Aten Sewage Disposal Co., 286 Fifth Avenue, New York, N. Y.

168. *Illustrated treatise* on the disposal of sewage according to the Aten System.

SHEATHING

Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.

171. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.

The Brown Co., Portland, Me.

172. *Sample book of "Bermico" Sheathing Papers* sent to interested parties.

Porete Mfg. Co., 20 Verona Avenue, Newark, N. J.

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

173. *Eight-page Folder.* Describes Adamant Sheathing Board for use instead of wood sheathing.

SHINGLES—ASPHALT

Winthrop Tapered Asphalt Shingles, 1[illegible] S. La Salle St., Dept. No. D-20, Chicago, Ill.

SHINGLES—METAL

Cortright Metal Roofing Co., 50 North 23rd Street, Philadelphia, Pa.

174. *"Concerning That Roof."* A complete catalog describing and illustrating Cortright Metal Shingles and Trimmings. 7 x 10¾ in. 32 pp.

SLATE—See also Roofing

Knickerbocker Slate Corp., 153 East 38th Street, New York, N. Y.

F. C. Sheldon Slate Company, Granville, N. Y.

175. *Commercial and Architectural Roofing Slate* in all colors and textures. Also blackboards, structural and electrical slate. Slate Granules.

STAIRWAYS

Bessler Movable Stairway Co., Akron, Ohio.

169. *Illustrated catalog,* containing 24 pp., describes how the Bessler Movable Stairway saves floor space and adds an extra convenience to the home.

STANDARD BUILDINGS

Truscon Steel Co., Youngstown, Ohio.

176. *Truscon Standard Buildings.* Fourth Edition. Catalog. 8½ x 11 in. 40 pp Illustrated. Erection details, cross-section diagrams and adaptations are given.

STONE, BUILDING

Art Stone Co., Waynesboro, Pa.

170. *Descriptive circulars with illustrations* of different marbles in colors. Sent free to any interested party.

STORE FRONTS

J. W. Coulson Co., Columbus, Ohio.

252. Store Front Construction simplifies the problem for the builder and owner. It beautifies and embances the value of store property. A special device prevents glass breaking.

Detroit Show Case Co., 1660 W. Fort Street, Detroit, Mich.

Kawneer Co., Niles, Mich.

177. *Kawneer Store Front.* Illustrated catalog. Drawings and details of construction. Size 8½ x 11 in. 32 pp.

178. *Full Size Details Kawneer Construction.* Blue prints. Size 30 x 30 in.

179. *A Collection of Successful Designs.* Portfolio. Shows 34 typical store fronts with elevations. Size 9 x 12 in. 38 pp. Catalog B. J. 8. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STRUCTURAL STEEL

National Pressed Steel Co., Massillon, Ohio.

STUCCO—See also Cement

American Materials Co., 101 Park Avenue, New York, N. Y.

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

182. *The Stucco House.* Contains many beautiful illustrations of houses finished with stucco and selected particularly for their architectural value. Detailed illustrations of stucco surface textures and drawings showing wall construction with revised specifications covering application of stucco. 96 pp. 8½ x 11 in. Price 50 cents.

180. *Guide to Good Stucco.* A book telling of the advantages of Portland Cement stucco, and how to apply it. Shows numerous finishes obtainable with ATLAS WHITE Portland Cement. 28 pages. 8½ x 11 in.

National Kellastone Company, 155 East Superior Street, Chicago, Ill.

183. *Specifications for Stucco Work.* A booklet containing complete specifications in detail for the use of Kellastone stucco for new buildings as well as the "overcoating" of old buildings. 13 sheets of text, 2 sheets of illustrations. 8 x 11 in.

184. *The Story of Kellastone Imperishable Stucco.* In this most interesting book the merits of Kellastone are set forth in a convincing manner. Every page contains pictures of beautiful houses stuccoed with Kellastone, and there are two pages in color. 22 pp. Illustrated. 8½ x 12 in.

Rochond Co., Van Wert, Ohio.

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Avenue, Cincinnati, Ohio.

181. *Bishopric for All Time and Clime.* Catalog. 7½ x 11 in. 52 pp. Illustrated. Describing the use of Bishopric Stucco and Plaster Base and Bishopric Sheathing.

STUCCO-MAGNESITE—See Stucco

American Materials Company, 101 Park Avenue, New York, N. Y.; Weed Street and Sheffield Avenue, Chicago, Ill.

185. *Elastico, the Stucco of Permanent Beauty.* Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.

Natl. Kellastone Co., 155 East Superior St., Chicago, Ill.

United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

SURVEYORS' INSTRUMENTS—See Levels

SUSPENDED CEILING

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

186. *Loose-leaf Bulletins.* 8½ x 11. Jester-Saskett, consists of plaster board applied to metal channels with special clip, ready for plastering.

THERMOSTATS—See Heating Equipment

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Building, Chicago, Ill.

187. *Handbook of Hollow Building Tile Construction.* 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.

National Fire Proofing Co., 250 Federal Street, Pittsburgh, Pa.

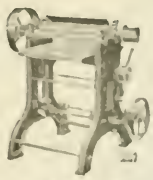
188. *Standard Wall Construction Bulletin 174.* 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.

189. *Industrial Housing Bulletin 172.* 8½ x 11 in. Illustrated. Photographs and floor plans of typical workingmen's homes.

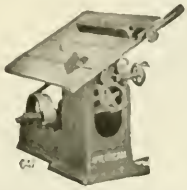
190. *Natco on the Farm.* 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.

191. *Fireproof Buildings of Natco Hollow Tile.* Booklet. 8½ x 11.

Pyramid Tile Machinery Co., 140 So. Dearborn Street, Chicago, Ill.



American "Jewel" Bench Planer



American "Variety" Tilting-Table Saw Bench



American "Universal" Saw Bench



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"Furnishes All Necessary Mill Work"

THAT is what Frederick Skon, a carpenter and builder of Jersey City, N. J., says about the American Contractors' Variety Woodworker.

His letter is as follows:

> "The Contractors' Variety Woodworker has proven very satisfactory in my shop. I cannot say what department the machine has proven most useful in, as the rip-saw, cross-cut saw, jointer and mortiser are in constant use by two men in my shop. I think it is sufficient recommendation for the machine to say it furnishes me with all necessary mill work."

Hundreds of contractors, builders and carpenters, the country over voice the same enthusiasm, on the all around utility of the "American" Contractors' Variety Woodworker.

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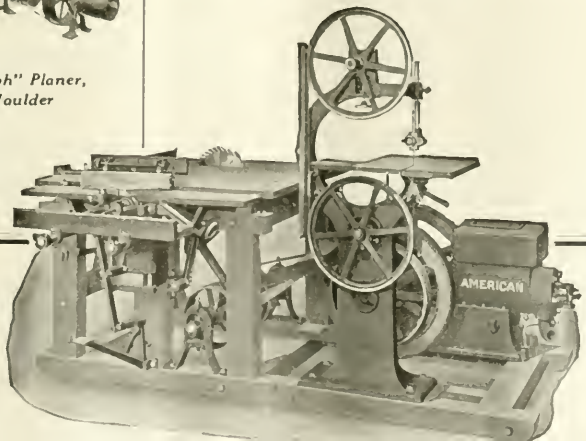
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Furnish with Built-in Gasoline Engine, Self-Contained Electric Motor or for Belt Drive.

Portable Variety Woodworker with 20-Inch Band Saw.

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 76*

238. An eight-page illustrated circular describing the advantages of "Pyramid Tile."

TIMBER CLAMP
Schenk Timber Clamp Co., 501 Fifth Avenue, New York City.

TOOLS
C. E. Jennings & Co., 321 Winthrop Avenue, New Haven, Conn.
Mack & Co., Rochester N. Y.
Progressive Mfg. Co., Torrington, Conn.
Sargent & Co., New Haven, Conn.
Stanley Works, New Britain, Conn.
James Swan & Co., Seymour, Conn.
The L. & I. J. White Co., Buffalo, N. Y

TRACTORS
C. H. & E. Mfg. Co., Milwaukee, Wis
253. Bulletin No. 4, Tractors.

TRAILERS
Rogers Bros. Co., Albion, Pa

TRANSITS (See Levels)
Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.

TRUSS LOOPS
The Bostwick Steel Lath Co., Niles, Ohio.
235. *"Beautiful Permonent Walls,"* 22-page illustrated catalog. 4x9 inches.

VENTILATION
Automatic Ventilator Co., 1003 Park Avenue, Baltimore, Md.
192. *Illustrated Folder.* Describes the construction and installation of an automatic ventilator which can be installed at the top or bottom of a window, either inside or outside.
Royal Ventilator Company, 415 Locust Street, Philadelphia, Pa.
193. *Descriptive Catalog* of round and rectangular ventilators made in galvanized iron, copper, etc. Illustrated.
The Stark Sheet Metal Works Co., Rex and Second Streets, S. E., Canton, Ohio.
E. G. Washburne Co., 207 Fulton Street, New York, N. Y.
194. *Illustrated Booklet* of metal ventilators, weather vanes, lightning rods, etc.

WALL BOARDS
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
195. *Descriptive catalog and sample of Linabestos Wall Board* for interior construction. Flame-proof and fire-resisting wall board.
Beaver Board Co., Buffalo, N. Y.
196. *Illustrated folder,* describing various uses and the methods of handling Beaver Board to the best advantage. Samples with descriptive literature sent on application.
Bishopric Mfg. Co., Cincinnati, Ohio.
198. *Booklet. "Bishopric for All Time and Clime."* Containing facts and figures, and illustrated with photographs of beautiful houses built with Bishopric stucco, plaster and sheathing units. Sent free.
Compo-Board Co., 5778 Lyndale Avenue, North, Minneapolis, Minn.
199. *Catalog sent on request with sample.* Describes many uses of Compo-Board.
McAndrews & Forbes, 200 Fifth Avenue, New York, N. Y.
200. *Folder.* Describing uses and application of Fiberlic Wall Board, together with sample of same sent to any address.
United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.
201. *Walls of Worth.* Booklet. 8½ x 11 n. 24 pp. Illustrated. Describes Sheetrock, the fireproof wall board, its advantages and uses.
Upson Company, Lockport, N. Y.

WALL FURRING
United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.
202. *Thirty-two-page Booklet.* 8½ x 11 in. Pyrobar. Tile.

WATER HEATER
Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WATERPROOFING—See also Dampproofing
Truscon Laboratories, The, Corner Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
206. *Science and Practice of Integrol Waterproofing.* Pocket size, 33 pp. Illustrated. Contains full specifications for waterproofing MASS Concrete, stucco and Cement Plaster Coat. Entire chapter devoted to "Practical Application of Waterproofed Cement Plaster Coat."
207. *Technicol Pamphlet No. 8.* Booklet. 4 x 7 in. 28 pp. A discussion of why concrete requires waterproofing and the properties an integral waterproofing must possess to operate effectively with the natural properties of concrete.

WATER SUPPLY SYSTEM
Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WEATHER STRIPS
Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.
239. Six-page illustrated circular, describing the product as used for Hotels, Residences and Institutions.
Diamond Metal Weatherstrip Co., Columbus, Ohio.
242. 34-page illustrated catalog. 8½ x 11¼ in. Containing blue prints of the various styles and sizes of Weatherstrip.
Monarch Metal Products Co., 5020-26 Penrose Street, St. Louis, Mo.
210. *Cause and Effect.* A series of pamphlets describing Monarch Metal Weather Strips, which are made of bronze, brass and zinc. They differ from all other strips in that they are applied in spaces around doors and windows as elastic fillers and not over the space as covers. Each 4 pp. 8½ x 11 in.

WEATHER VANES
E. G. Washburne & Co., 207 Fulton Street, New York, N. Y.
211. *Descriptive Catalog in Colors.* Showing two different designs of weather vanes, lightning rods, ventilators, etc

WINDOWS—See Also Doors and Windows
The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.
254. BOCA steel sash. (E-22.) A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.
Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.
Hope & Sons, Henry, 103 Park Avenue, New York.
212. *Catalog.* 12¼ x 18½ in. 30 pp. Illustrated. Full size details of outward and inward opening casements.

WINDOW CASEMENTS
The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.
254. BOCA steel sash. (E-22.) A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.

WINDOW HARDWARE
Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.
The Kawneer Company, Niles, Mich.
213. *Kawneer Simplex Windows.* Catalog. 8½ x 10¾ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installations in residences and buildings of all sorts.
214. *Detail Sheets and Installation Instructions.* Valuable for architects and builders.
Monarch Metal Products Co., 5020 Penrose Street, St. Louis, Mo.
232. 16-page illustrated catalog, 4 x 9 in., on Window Casements.
National Mfg. Co., Sterling, Ill.
Pullman Mfg. Co., Rochester, N. Y.
Samson Cordage Works, Boston, Mass.
Catalog. 3½ x 6¼ in. 24 pp. Illustrated. Covers complete line.
Sargent & Co., New Haven, Conn.
Stanley Works, New Britain, Conn.

WOODWORKING MACHINERY
American Saw Mill Machinery Co., Hackettstown, N. J.
217. *Contractors' Bulletin No. 77.* Describing various types of portable Variety Woodworkers. General catalog No. 22, describing a general line of woodworking machinery.
W. F. & John Barnes Co., 71 Rudy Street, Rockford, Ill.
218. *Catalog.* Containing description of rip and other machine saws, formers, mortises, tenoners, lathes. 38 pp. Illustrated.
C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
219. *Catalog* of portable saw rigs, pumps, compressors, engines, etc. 48 pp. Illustrated.
The Crescent Machine Co., 259 Main Street, Leetonia, Ohio.
220. *Catalog.* Describing band saws, shapers, jointers, planers, borers, mortises, etc. 144 pp. Pocket size. Illustrated.
Hutchinson Mfg. Co., Lafayette Street, Norristown, Pa.
221. *Illustroted descriptive circular* of portable woodworking machinery that you can take to the job, using it on a bench.
R. E. Kidder Co., 35 Hermon Street, Worcester, Mass.
222. Catalog. Describing improved boring machine and how it can be used.
Parks' Ball Bearing Machine Co., Sta. "A," Cincinnati, Ohio.
223. *Illustroted Folder.* Describing Parks' Planing Mill Special, comprising circular saw, jointer, band saw, shaper, borer, tenoner, etc.
J. D. Wallace & Co., 1401 Jackson Boulevard, Chicago, Ill.
225. *Bulletin No. 219-K.* Describes portable electric punch machines, tools, planers, jointers, circular saw, etc.
Woodworkers Mfg. Co., 614 Bush Street, Detroit, Mich.

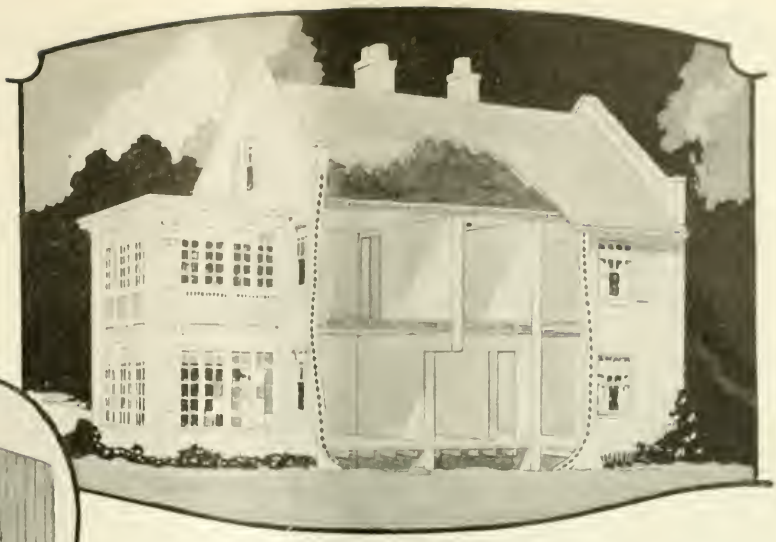
How Many Possible Buyers Get Your Catalogues?

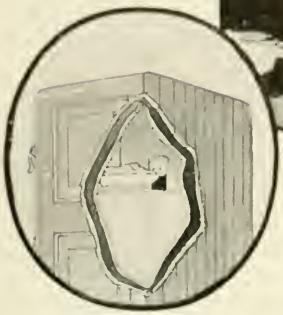
The manufacturers whose catalogues are listed in "Selected List of Manufacturers' Literature" are getting results—that is why they continue to describe their catalogues in this list.

You can get similar results. Insert a brief description of the catalogues you issue and you will note a ready response from Builders, Contractors and Architects who are always eager to learn of new products or new uses for old products.

The cost is nominal—only $5 per listing per month.

Building Age and The Builders' Journal
920 BROADWAY NEW YORK





What makes a refrigerator independent of the weather? Dead air space. See how this principle is used in Hollow Tile.

Take a Hint from the Ice Box

Read Why Some Houses Are Cool and Comfortable in Summer

Swing open the refrigerator door to get a glass of milk or something—how cold it is!

That's due to dead air space.

Dead air space permits neither heat nor cold to pass. The scorching rays of the summer sun cannot filter through the dead air space in Hollow Tile.

Sell your customers the comfort of coolness as well as a house. Show them how Hollow Tile keeps the home cooler in summer and warmer in winter—saving coal.

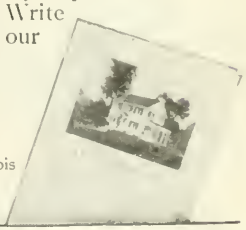
Here is a fine point to close a sale—this extra convenience without additional cost.

Build with Hollow Tile—fireproof, weatherproof and strong. When you show how it costs only 5 per cent more than wood—Man, the job is yours! Write for free plan folders. Take advantage of our complete plan service.

Complete plans and specifications of many types of houses, farm buildings and garages are ready for you at the Hollow Building Tile Association.

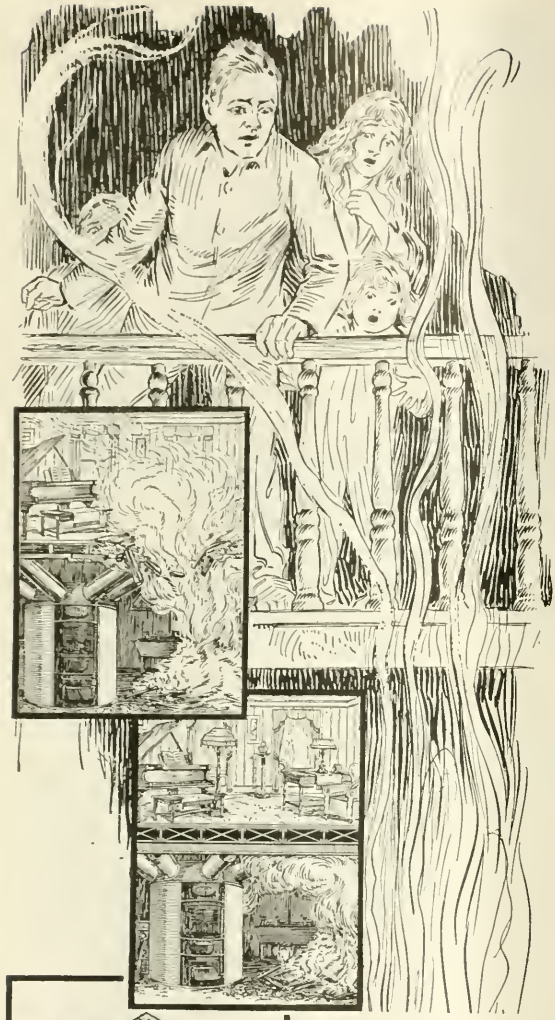
HOLLOW BUILDING TILE ASSOCIATION

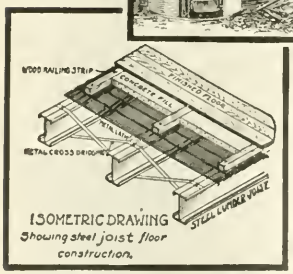
Dept. 196, Conway Building Chicago, Illinois



HOLLOW TILE

THE MOST ECONOMICAL FORM OF PERMANENT CONSTRUCTION





ISOMETRIC DRAWING
Showing steel joist floor construction.

The panels above show the effect of basement fires on a wood floor as compared with a Steel Joist Floor. Lower panel shows Steel Joist Floor detail. Over 2,000 dwelling fires occurred every week last year. Most of them started in basements.

The Enemy Within

EVER since life came upon earth there has been enmity. Man has his enemies. Animals have their enemies. Birds, trees, fish—all have their enemies.

And that building that shelters you and yours has its enemy, too. It ever lurks within that home, eager to devour it together with your loved ones and treasured possessions.

We call that enemy FIRE. You dread it. And yet you foster it. You build with inflammable materials and thus place food in its path throughout your home. When it attacks you, you fight it. It's usually a losing game. Don't fight fire out—build it out.

Perhaps you, like many others, have always thought firesafe construction too costly for homes. You approved it for office buildings, theatres, etc., but you felt that you couldn't afford it. That may have been true in years gone by. But it's not true today.

Basement walls are fireproof. But if you cover your basement with a wood-beam floor you encourage the home's destruction. Build a Firesafe First Floor over those fireproof basement walls and cut off from the livable sections of your home the fire hazards located in the cellar.

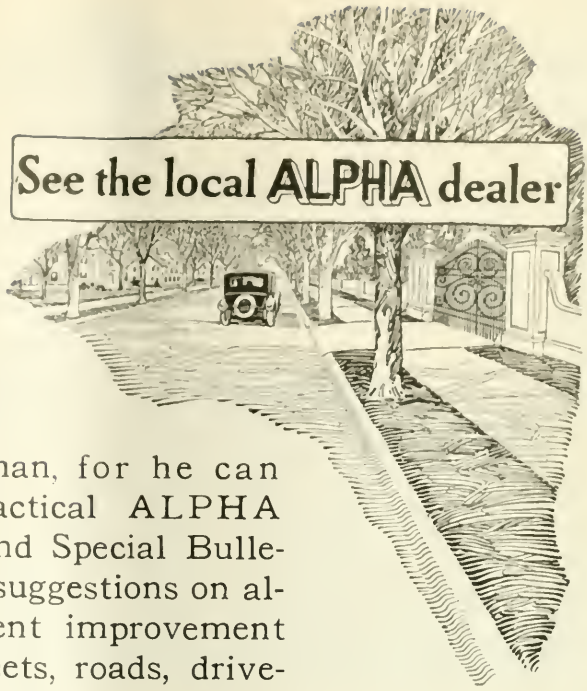
The cost of this simple construction is little more than common wood-beam floor construction. National Steel Joists are as light as wood beams and as easily handled. Many millions of square feet of floor space have been built with these steel joists in dwellings, schools, office buildings, apartments, etc. Stocks of National Steel Joists are carried by most structural steel companies throughout the country.

Send us a pencil sketch or picture of the residence, store or other building you are planning and blueprint layout, list of materials, estimate, etc., will be furnished without charge. We have a pamphlet for contractors giving safe loading tables and details. Shall we mail you one?

The NATIONAL PRESSED STEEL Co.
MASSILLON, OHIO
DIVISION OF CENTRAL STEEL CO.



NATIONAL STEEL JOISTS

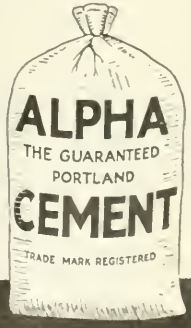


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Plants at: Alpha, N. J. Cementon, N. Y. Jamesville, N. Y. Manheim, W. Va.
Martins Creek, Pa. La Salle, Ill. Ironton, Ohio Bellevue, Mich.



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Poor dealers make a poor town. A poor town doesn't build. It can't.

Strong dealers make a strong town. A strong town does build. And keeps on growing.

Strengthen your dealers and you strengthen your town. Strengthen your town and you strengthen yourself. It's simple. Hard sense. Good business.

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Your dealer knows you and can give you a line of credit. Without credit no business man can get very far.

And finally, your live dealer is your best salesman. He is constantly getting tips. He has to turn them over to you because he can't use them himself. And if he turns his tips over to you, the least you can do is to turn your business over to him.

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THE IDEAL EXTERIOR WALL COVERING

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BUILDING AGE

AND

THE BUILDERS' JOURNAL

NEW YORK, JULY, 1922



Modern Bungalow Types

Attractive Small Homes Being Erected by Progressive Builders in a Pleasing Variety of Design and Color

NOT so many years ago a bungalow was considered merely a sort of shack. Gradually the idea has grown and during the past twenty years the exterior designs have constantly improved in appearance. Many of the bungalows that are being erected today have behind them the best architectural thought. All types of architecture seem to have been drawn upon to obtain the pleasing results that are today so apparent in practically every locality.

The bungalow idea, as is well known, originated in India. Here in the United States its use is steadily growing in popularity owing to its convenience; in most cases it is simply a well appointed apartment contained in a house by itself, and this feature endears it to the woman who likes an apartment but wants a private house.

The bungalow design shown above is an adaption from the Spanish. The rough cast stucco gives an artistic finish that is entirely in harmony with the lines of the building and the roof of Spanish tile gives a touch of red to the structure. The building is severely plain in design which serves as a background for its outstanding features—an ornamental doorway in which Spanish detail has been faithfully carried out.

In a building of this sort, we naturally expect a patio and of course this has been included and the entrance to it will be noticed on the left hand side of the picture.

Iron guard rails are placed at each window for ornamental effect only. In a great many Spanish buildings, the windows are entirely barred all the way up and an iron entrance gate is usually used. The Spanish citizen seems to have an idea that his "casa" is liable to be attacked and he takes all means possible of barring out intruders. The American spirit, however, is better expressed in our omitting all sorts of such barrier on our homes for fear that it would look inhospitable. The American idea seems to be "The latch string is out, come on in—you are welcome."

Next to the Spanish style, the Italian seems to have been drawn on quite a good deal for ideas for bungalow builders. Its architecture lends itself very readily to artistic results when properly handled. Italy, however, does not abound in one-story houses, they seem to have the go-up-stairs' habit.

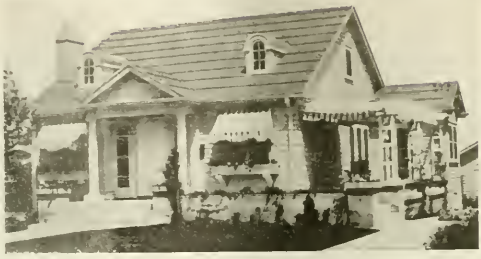
Both in the Spanish and Italian houses stone stairways seem to be the rule, while in our American houses wood is the favorite. The Italian and Spaniard, when he is pre-



Suggesting the Italian Style Villa

vented by the expense from using the marble that he likes so much for his interior work, has his walls plastered or stuccoed and his is painted and veined to represent some marble.

The idea of using stone for staircases has emigrated to the Western Hemisphere quite a good deal in Spanish-speaking countries. In Cuba white marble seems to be the favorite material for staircases; even the handrails being frequently made of polished marble and this, too, in some of the cheaper dwelling houses.



The New England Colonial Styles Suggested This

While we like to have Italian and Spanish style bungalows, we do not follow the interior arrangements of these countries, in that, we seem to be all American in our idea of what is comfort.

The Colonial architecture of our New England ancestors has been drawn on quite freely for ideas to be used in creating new bungalow designs. The plain gable roofs with perhaps a few dormers, delicate columns and well-proportioned doors give grace combined with the substantial appearance to designs modelled after this interesting phase of American architecture.

A very interesting example modelled after New England Colonial lines is shown herewith. One of the other illustrations shows a two-family or rather twin bungalow with a New England Colonial influence in its make-up that is quite pleasing.

The Dutch Colonial style of bungalow follows the lines of the old houses that were built around Philadelphia by some of the earlier settlers. A hooded entrance is usually the distinctive feature and in the design shown herewith this has been retained, the brick steps and shingled exterior with the solid shutters on the front windows are all details borrowed from this popular form of our domestic architecture. The Dutch Colonial style has been followed to quite an extent, some even have the gambrel roof effect so common in Eastern Pennsylvania.

The English style house has been drawn on quite a good deal for bungalow designs, half timbered effects being worked in the gables with pleasing results. Usually the main part of the house is of stucco or brick with the half timbered and stucco effect in the gables only, in other cases, the half timbered effect is carried out throughout. In other words, some of the old houses of England have served as models for many successful bungalows.

Many bungalows having a pleasing exterior cannot be classed as of any particular style of architecture. One of these designs is shown here; it has just a little touch of English influence in the front gable but that is all; the balance of the house is typically modern American. It has made use of a number of materials—there are concrete block foundation, cobblestone chimney, or brick walls and stuccoed. While there is no real architecture in this, the result seems to meet with popular favor, as quite a number of such houses have been built.



Just No Style But Homey and Comfortable

The flat prairies of our midwest states have suggested a horizontal line treatment for buildings, wide overhangs seem to be the rule, the effect being of a wide brimmed hat. Many bungalows situated in our midwest states have been patterned after this style of architecture and an interesting bungalow example is shown in this article. This is a stuccoed design and it has been worked out in a very creditable shape. It certainly suggests and typifies the flatness of



A Mixture of French and Colonial Lends Beauty

the prairies that gave birth to its design.

Switzerland has not been overlooked in the selection of bungalow designs, as its famous chalets have served as models for many attractive designs, especially those located on hillsides as this style gives the opportunity for using field stone, balconies, hooded windows, etc. Of course, to get the best effect, the ground should be treated in Alpine fashion, a number of evergreens being planted among rocks and the front entrance should be reached preferably by a winding path bordered with rock.

The exterior of many bungalows follow no style of nameable architecture, still they present a very attractive appearance due to the skillful work of the designer.

Bungalow design has had more thought given to it than one would think, and the results of this earnest work are becoming manifest in the number of very pleasing examples recently erected. Perhaps making various combinations of the sort will develop into a sort of hybrid design that will be typically American.

The Prairie Style Horizontal Roof Lines Predominating Feature



common brick construction. Brick and stone are also used to quite an extent. The concrete block, however, has been used with poor success owing to the fact that people who have been using this to quite an extent simply use it for economy's sake and not with the idea of getting any beauty. Some very attractive looking designs, however, are capable of being worked out by the use of cement block. So far it has been a case of not knowing how to use the material on hand.

The use of metal is also coming into vogue both for roofs and siding of bungalows and the chances are that in the not remote future, many buildings with metal exteriors will be erected. Many very desirable designs can be worked out and no doubt some bungalows will evolve something that is artistic in metal siding without having the metal try to imitate some other material. True beauty in the use of any material lies in the fact that it should not appear in disguise.

Particular attention is now being paid to the roof. The different materials now on the market enable one to obtain a beautiful roof at but small expense by the means of various acids, stains and paints and many artistic roof effects are obtainable at a remarkably small cost. The roofing materials themselves can also be had in various forms, and color so that practically any design in the way of a roof can be carried out.

The use of color on roofs is receiving more attention, the mottled effect is very pleasing on certain styles of houses and this is very easily produced by use of different stains or different shades of material.

The floor arrangement of modern bungalows has also been the subject of much careful thought, and in a future article the different usual and unusal types will be described.

Modeled After the Dutch Colonial Homes of Pennsylvania





Twin Bungalows Can Be Made Quite Attractive

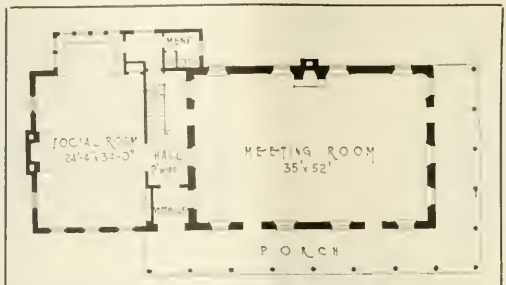
Various kinds of building materials can be successfully used for the exterior of bungalows. Drop siding, bevel siding, vertical boarding and shingles are forms of wood covering that lend themselves very readily to many artistic designs, whether used singly or in combination with some other material.

Stuccoed bungalows are quite common. They can either have a wood frame or be of hollow tile, concrete or



A Pleasing Adaptation of the Swiss Chalet

Friends Meeting House



Main Floor Plan

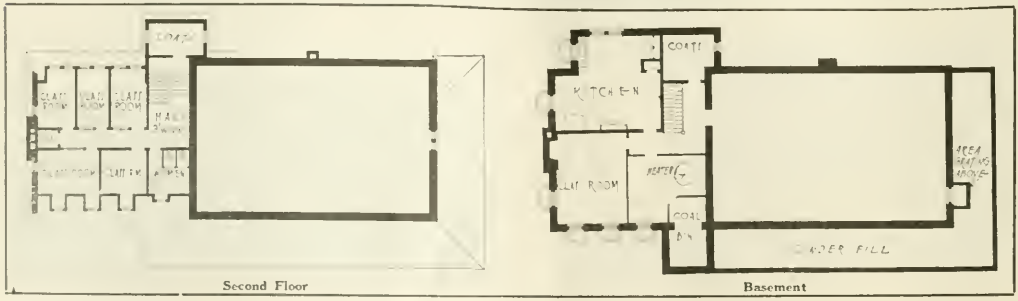
HEACOCK and HOKANSON, Architects



CHURCHES vary in their architectural treatment. Here is something a little different in the way of a house of worship. It is the School Lane Meeting House of the Society of Friends, located in Germantown, Philadelphia, Pa.

The larger portion of this building, used as the meeting room, was an old building of the mid-Victorian age, very similar to the railroad type of freight stations that were erected in those days.

The building was remodeled and a wing added to the left. The roof was extended so as to come down to form the porch, which is a distinctive feature of the present edifice. The building is of brick with plaster finish on the exterior. The contractors were Frederick Elvidge & Son of Philadelphia. Heacock & Hokanson of Philadelphia were the architects for the remodeling of this building.



Second Floor

Basement

ORGANIZATION *of the* AMERICAN CONSTRUCTION COUNCIL

IN OPENING the organization meeting of the American Construction Council at the Washington Hotel, Washington, D. C., June 19th, Secretary of Commerce Herbert Hoover stated that "If we would stem the tide tending to refer every little need and complaint to government, action to meet these demands must arise from within industry itself." He declared that in thus bringing all representatives of the construction industry together to see if such a council can be organized the most important step in the history of industry was being taken.

Among the subjects suggested by Secretary Hoover for the consideration of the Council were standardization of grades, inspection of, and simplification of dimensions of construction materials, the collection of statistics, the encouragement of home building, zoning, proper building codes, seasonal and intermittent employment, jurisdictional disputes, apprenticeship, vocational training and in general the elimination of unnecessary speculation and the better functioning of industry in regard to our national needs.

Aims and Purposes

A warning against "an intense stratification of the various economic interests in our national life" which lead to selfish aims and purposes was voiced by Willis H. Booth, vice-president of the Guaranty Trust Company of New York, in following Secretary Hoover. If the public confidence is to be gained the aims and purposes of the Council must square and comport itself entirely with the best public judgment, he said. He denied proposing an impractical altruism which was not consistent with actual facts, but declared such a basis was "an enlightened kind of selfishness which will take us further because it is more nearly right." Illustrating his point he went on to say: "If we can surround the construction industry with a feeling of stability we immediately add to its ability to secure credit." This feeling of stability, he stated, was based on the confidence which the public gave to the industry.

Two hundred representatives of every element of the industry were in attendance at the meeting, including architects, engineers, general contractors, sub-contractors, labor, manufacturers, dealers, bankers, insurance and bond interests, public utility corporations, state, federal, county and municipal construction departments.

Aid from Supply Dealers

M. T. Bannigan, president of the National Building Supply Dealers Association, said: "We went to war to prove that might did not necessarily make right. We are organizing this Council to establish the principle that the good of any element of the construction industry depends upon the good of every component part of the industry."

Architects' Co-operation

Henry H. Kendall, past president of the American Institute of Architects, stated that the architects were happy to be among those who are participating in the organization of the Council.

Public Utilities

William McClellan of New York, representing public utilities construction said: "The extreme difficulties encountered in construction as compared with other industrial problems, makes an organization such as this an inevitable factor. When a manufacturer gets an order he puts it through a factory with an organized force and system well established. Construction on the other hand necessitates in the very nature of things that those engaging in it have even to clear the ground, create their plant and organize their forces before they can begin to build. And on the next contract, they must do it all over again.

View of the Insurance Interests

Ralph F. Proctor, of the Maryland Casualty Company of Baltimore, representing insurance and bonding companies, said: "Although the Bible says 'He that is surety for a stranger shall smart for it, and he that hateth suretyship is sure,' we would welcome a better understanding by our clients of our business and its problems. It is with enthusiasm, therefore, that we join in the work of the American Construction Council, and you may be assured of our hearty co-operation in coordinating and building the construction industry."

Proper Co-ordination

The importance of coordination was emphasized by Frederick L. Cranford of New York, vice-president of the Associated General Contractors of America, who said: "For forty years American business has been passing through a transformation from individualistic to collective and cooperative activity, but the co-operation so far developed in construction has been the effort of the members of a unit of the industry, and they have counted the successful though often antagonistic to the interests of the industry, so that while individually we were important, our cooperative efforts have proved ineffective.

The Part of Labor

A very significant stand was taken by labor engaged in building trades when the organized building trades endorsed the American Construction Council and voted unanimously to affiliate with the Council at their recent convention in Cincinnati.

"We believe that the Council can be a most potential factor in the stabilization of the industry we serve," said John Donlin, head of the Building Trades Department, American Federation of Labor, "and we hope that all the elements of the industry will affiliate."

He stated that the Council should be a fact-finding agency to determine rights and wrongs, and to serve to eliminate wrongs inflicted by a few in each element of the industry. It was his opinion that the Council should establish and maintain local conference committees in all cities, these being necessary for local guidance to hold the confidence of the public, to avoid strikes, lockouts, and to protect the industry against uneconomic abuses.

Manufacturers' Viewpoint

James A. Emery, counsel for the National Manufacturers Association, who followed Mr. Hoover in presiding at the meeting, said that this was an opportunity to set up in an unusual way, self-government in the construction industry, a self-government which can speak for itself and act with intelligent vision, and accept for one of its important duties the cleaning up of the industry from the inside when it is in need of this. "It has," he said, "its own function, its own authority, and as I see it can make itself a self-reformative body without any regulatory power of the government. It can be self-governed or it will be governed by the people by their elected officials."

Highway Interests Helping

Thomas R. MacDonald, chief of the Bureau of Public Roads, emphasized the relationship of the highway industry with the whole construction industry.

Engineering Interests

In speaking for the engineers, Mr. Calvert Townley of the Westinghouse Electric and Manufacturing Company of New York said:

"A movement to coordinate with the object of performing better public service is distinctly a move in the right direction."

Election of Officers

Franklin D. Roosevelt, formerly Assistant Secretary of the Navy, was formally elected President of the American Construction Council, and John B. Larner, vice president of the American Bankers Association, was elected treasurer. General R. C. Marshall is Chairman of the Temporary Operating Committee.

Owing to illness Mr. Roosevelt was unable to be present, but sent a letter which was read; certain portions of this letter we print in a box as it outlines his aims.

Executive Board

The Executive Board of the Council is composed of men prominent in their respective fields. Amongst the groups represented are Architects; Engineers; General Contractors; Sub-Contractors; Labor; Material and Equipment Manufacturers and Dealers; Financial, Bonding and Insurance; Public Utilities; Federal, State, County and Municipal Construction Departments; and Federated Associations.

During the two days' session two hundred representatives of these interests carefully considered what can and ought to be done to put the construction industry as a whole on a higher plane and to determine ways and means of working together to that end.

Practical Work Outlined

The immediate program of action suggested for the new Council as a result of these deliberations include:

> THERE is absolutely no doubt that the construction industry must do something constructive. I refer not to abuses of power in the past, by this, that or the other individual or local organization; I speak of the fact that an immense sum of money, energy and happiness on the part of the American people can be saved if the existing waste is eliminated.
>
> In my judgment the American Construction Council must be broad enough to include every element, and it must be strong enough to strike at any individual or association of individuals which fails to live up to certain simple standards of ethics in business dealings. It may be felt by some that there would be danger through the limitation of freedom of action of the individual, but it must be remembered that the public as a whole are concerned in the efficiency, honesty and honor of all the groups constituting the construction industry. It goes without saying that if the members of the construction industry are unable to keep their own house in order, an exasperated public will some day regulate their house for them.
>
> FRANKLIN D. ROOSEVELT.

The formation of a code of ethics acceptable to the whole industry and to the public.

The gathering of adequate statistics from all sources and resulting interpretation having all the facts.

The reduction of the national shortage of building trades mechanics and the establishment of the necessary apprenticeship system.

Co-operation in establishing uniform building codes throughout the country.

Co-operation with the railroads in expediting the revision of existing freight rates on construction materials. The establishing and strengthening of local organizations throughout the country to bring about the co-operation of all elements in conformity with the principles of the Council.

The mitigation of the evils of seasonal employment and trade migration of labor.

The encouragement of local building shows.

Simplification, standardization and elimination of waste.

Education of the public to the distribution of its construction and maintenance requirements more evenly throughout the year.

The promotion of health and safety of workmen.

The reduction of loss of life and waste of construction materials from preventable fires.

The study of old buildings in order to establish superior methods of construction.

The education of the public as to the necessity and economy of properly maintaining existing structures.

About a Code of Practice

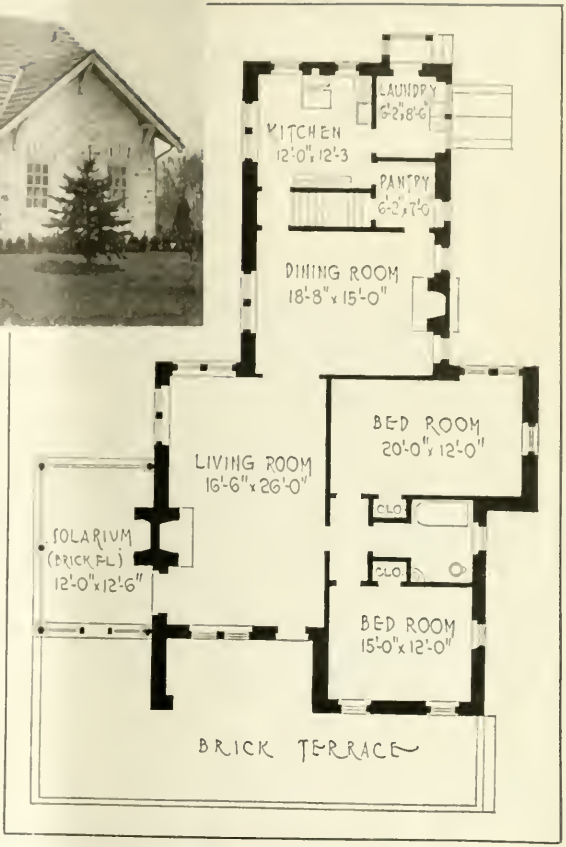
Mr. Walter Gordon Merritt, attorney in New York City, in presiding at the meeting of the Council emphasized the need of the co-operative action that the Council will bring about.

"The evils of the construction industry," he said, "are the evils of organizations, not the evils of individuals. Those evils have come about because of the selfish aims of the individual organization. The need is to restrain these selfish aims, and to have each group lay down a code of practice which must pass the judgment and be in accord with the rules and principles of the American Construction Council."

In stressing the necessity to work hand in hand with labor, he said that the organized labor movement is big enough to meet with and discuss its own problems with any of its critics.

"If we all meet and reason together," he continued, "we shall think, feel, and act together. The relation at the present time between employers and employees in the building trades, is one of periodic armistice. This Council must work out a plan of common counsel and joint action.





Stone Bungalow

NEWTON FLOUNDERS, Architect

HERE is a very interesting type of bungalow built of native stone. It is dignified in design and has a certain charm that will appeal to many. It is an interesting example of builders' work.

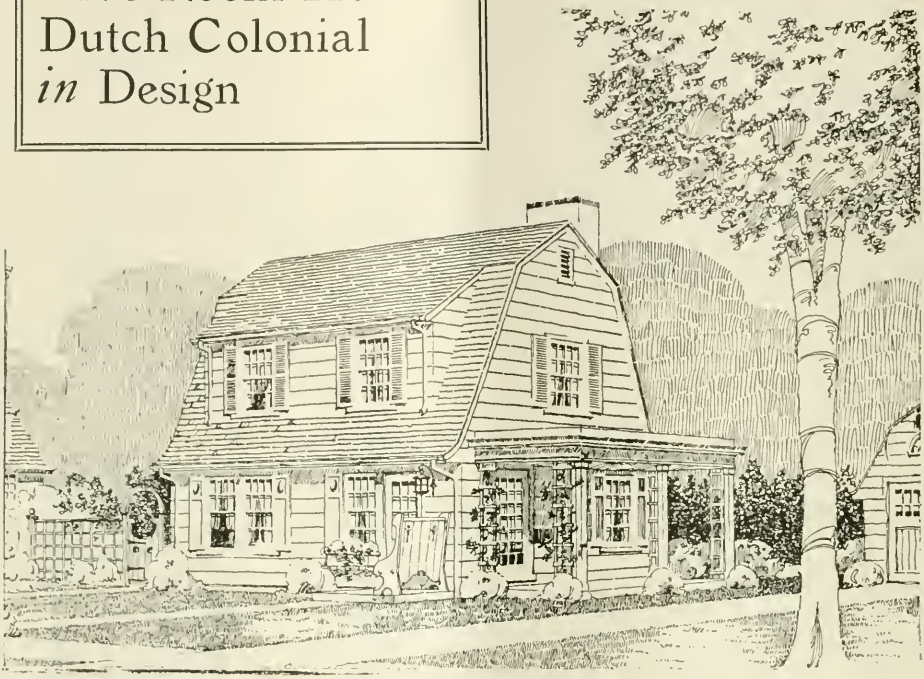
The flat dormer on front being placed to one side, is an unusual break that is a little different. The roof is covered with clay tile and its red color is quite a contrast to the gray stone below which, with its wide mortar joints pointed up in white, makes a very interesting and striking picture in its setting of green trees and lawn.

This bungalow was built for Dr. W. T. Werntz at Rose Tree, Upper Providence Township, Delaware County, Pa., and overlooks the famous Rose Tree Fox Hunting Club's premises. The builder was James B. Flounders of Media, Pa.



The Rear of the Bungalow is an Interesting Study of Roof Lines

Five Room Home Dutch Colonial *in* Design



HERE is a charming little house that can be built for about $5,500 and one that will provide a real home that is within the means of most everyone.

Inexpensive to build, and it requires but little housework, a good cozy home to be proud of; a possession that will certainly give more lasting satisfaction than a bunch of rent receipts.

The architects have worked out a very simple and economical plan and have combined with it an attractive Dutch Colonial exterior. Most houses of this very modest size look like "packing boxes" for want of proper roof treatment. This little cottage will hold its own among the most pretentious.

The rooms are comfortable, livable rooms and not mere nooks. As one enters the front door the house appears large; the fireplace, stairs and bookcase all count in the scheme, yet the arrangement is most economical. The stairs are very compact.

The two nice bedrooms are much larger than one would expect to find; they have cross ventilation and good closets. The bath is well arranged and there is not an inch of waste space. Note that the only hall in the entire house (halls are of little value as living spaces) is the very small pass at the second floor. This is what makes this house a big one in everything but cost. The laundry, heater, etc., are in the cellar.

Specially Designed for
BUILDING AGE
and
THE BUILDERS' JOURNAL
by R. C. HUNTER & BRO.
Architects New York

The complete working plans and specifications of this house may be obtained for a nominal sum from BUILDING AGE AND THE BUILDERS' JOURNAL.

Before you build, consider the location of your lot in relation to the kind of a building you wish to erect. It is a poor business plan to put an expensive building in a cheap location or a cheap house in an expensive, restricted neighborhood.

If you do not make the mistake of wanting too much in the way of a house, you will find that you can save money by owning our own home and you will get a good deal more pleasure out of life.

There is a satisfaction in owning a piece of real estate and a home of one's own. One takes a certain pride in keeping up the appearance of a home and grounds; things do not have that neglected appearance.

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc. Minor outs have been disregarded.

Quantity Survey

of Five Room Home Shown on Preceding Page

SUCH items as clearing site, temporary work and protection, scaffolding and general equipment and supplies, have not been included. Such items as are marked "Unit" are to be estimated in a lump sum, following requirements of plans and specifications.

Excavation

(Excavation for pipe trenches not included)		
Excavation for cellar	148	cu. yds.
Excavation for footings	11	cu. yds.
Excavation for areas	4	cu. yds.
Excavation for trench walls	11	cu. yds.
Excavation for leader drains and dry wells	10	cu. yds.
Backfilling around walls, etc.	31	cu. yds.
Leader drains and dry wells—		
Field stone for dry wells	8	cu. yds.
4 in. salt glazed tile drain pipe	30	lin. ft.
4 in. elbows	5	

Masonry

CONCRETE WORK		
Concrete for cellar walls	615	cu. ft.
Concrete for footings	142	cu. ft.
Concrete for trench walls	150	cu. ft.
Concrete for area walls	84	cu. ft.
Cellar floor. (3 in. concrete and 1 in. cement finish)	425	sq. ft.
Area Bottoms (brick and sand) floors (12 in. cinders, 3 in. conc. and 1 in. cement finish, colored and blocked off)	20 205	sq. ft. sq. ft.
Concrete forms	1800	sq. ft.
Pointing cellar window sills	14	lin. ft.

Plastering

Three coat Patent Plaster on metal lath. Gross (Net 360 sq. yds.)	420	sq. yds.
G. I. Corner beads	72	lin. ft.

Tile Work

Tile work for bath rooms—		
Floor, (1 in. hex, white)	42	sq. ft.
Wainscot (3 in. x 6 in. white wall tile)	104	sq. ft.
6 in. sanitary base	26	lin. ft.
Moulded cap	26	lin. ft.

Brick Work

Common brickwork for chimney (or 3.2 M.)	160	cu. ft.
Face brick for hearth and jambs (or 84 brick)	12	sq. ft.
Fire brick for fireplace (75 brick)	15	sq. ft.
8 in. x 12 in. T. C. flue lining	54	lin. ft.
3 in. bluestone chimney cap (1 ft. 10 in. x 2 ft. 8 in.	1	Unit

Mason's Iron Work

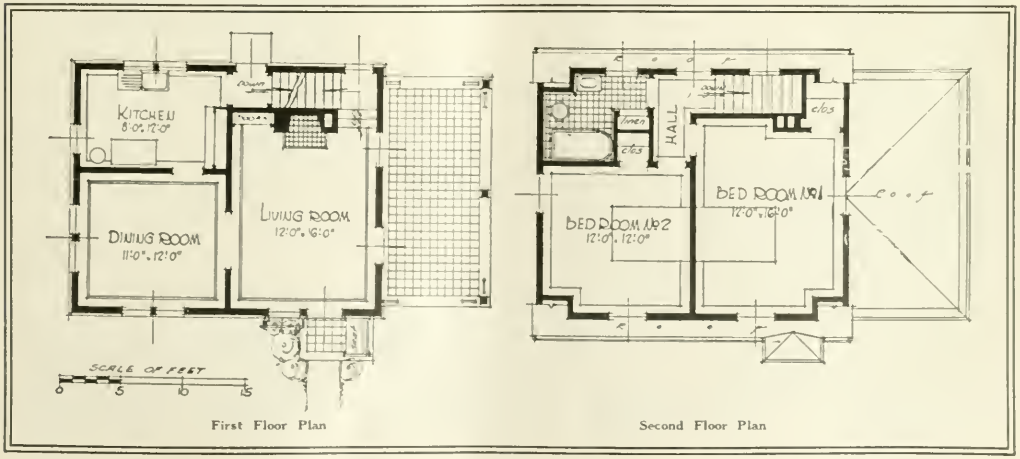
Fireplace damper (2 ft. 6 in. opg., with throat, etc.)	1	Unit
C. I. ash dump	1	Unit
C. I. cleanout door for ash pit (16 in.		
C. I. cleanout door for boiler flue (8 in. x 12 in.)	1	Unit
x 8 in.)	1	Unit
Thimble for boiler flue (8 in. dia.)	1	Unit

Sheet Metal Work

Tin roof on porches	220	sq. ft.
Tin flashing for roofs, etc.	105	lin. ft.
Tin flashing for column caps	3	caps
Tin flashing and counterflashing for chimney	14	lin. ft.
4 in. half-round hanging gutter (No. 24 gauge galv. iron)	91	lin. ft.
3 in. Tin leaders	74	lin. ft.
Bends for same	18	
Gutter thimbles	9	
3 in. x 4 in. G. I. gas range vent	20	lin. ft.
Cap and thimble for same	1	

Carpentry

TIMBER		
All No. 1. common stock, hemlock, rough unless noted.		
Cellar girders, 6 in. x 10 in. spc. 1/12, 1/8,	100	F. B. M.
2 in. x 3 in. nailer—40 lin. ft.	20	F. B. M.



First Floor Plan — Second Floor Plan

Carpentry (Continued)

Sills—4 in. x 6 in.—2/14, 4/12, 2/10	192	F. B. M.
Posts, 4 in. x 6 in.—4/10, 4/8	144	F. B. M.
Studs, girts and plates, 1st floor.		
2 in. x 4 in.—90/10, 36/8	739	F. B. M.
Studs, etc., 2nd floor.		
2 in. x 4 in.—174/8	927	F. B. M.
1st floor joists—		
2 in. x 10 in.—30/12	600	F. B. M.
2nd floor joists—		
2 in. x 10 in.—29/14	676	F. B. M.
2nd floor ceiling beams—		
2 in. x 6 in.—30/14	420	F. B. M.
Rafters—		
2 in. x 6 in.—24/14, 12/10, 12/8	552	F. B. M.
2 in. x 6 in—cut to radius—40/4	160	F. B. M.
Ridge—		
2 in. x 8 in.—2/14	38	F. B. M.
Living porch rafters—		
2 in. x 4 in. 16/8—2 in. x 8 in. 2/12	118	F. B. M.
Living porch ceiling beams—		
2 in. x 4 in.—15/10	100	F. B. M.
Plates—		
3 in. x 8 in.—4/10	80	F. B. M.
Col. cores—		
3 in. x 4 in.—3/8	24	F. B. M.
Floor bridging—		
2 in. x 2 in.—220 lin. ft.	73	F. B. M.
Cornice outlookers—		
2 in. x 4 in.—90 lin. ft.	60	F. B. M.
Cellar partitions (studs)—		
2 in. x 4 in.—6/14	56	F. B. M.
Sheathing (7/8 in. x 8 in. shiplap) no outs—		
Walls—to cover	1500	F. B. M.
Flat roofs—to cover	200	sq. ft.
Sheathing paper (waterproof)	1600	sq. ft.
Shingle lath—7/8 in. x 3 in.	2100	lin. ft.
Grounds—		
3/4 in. x 2 in. surfaced one side	1500	lin. ft.
Sheathing for cellar partitions—		
7/8 in. x 8 in. shiplap—to cover	100	sq. ft.
Rough flooring (7/8 in. x 8 in. shiplap)		
1st floor—to cover	465	sq. ft.
Furring (7/8 in. x 2 in.)	200	lin. ft.
Shingle roofs (18 in. stained shingles)		
9.3 squares	6400	shingles
Shingle sides (24 in. stained)		
12.4 squares	4100	shingles

Exterior Finish

Watertable (7/8 in. x 2 in. strip)	94	lin. ft.
Main cornice—		
7/8 in. x 4 in. fascia	54	lin. ft.
5/8 in. x 4 in. M. & B. ceiling—to cover	95	sq. ft.
5/8 in. x 7/8 in. cove	54	lin. ft.
Raking cornice		
1 1/2 in. x 2 in. cove	108	lin. ft.
Dormer cornice—		
7/8 in. x 3 in. fascia	42	lin. ft.
7/8 in. x 8 in. soffit	42	lin. ft.
5/8 in. x 7/8 in. cove	42	lin. ft.
Porch finish—		
Entrance porch—		
Sawed brackets, 4 1/2 in. thick, 1 ft. deep, 2 ft. 10 in. long	2	
Portable seat, 3 ft. 10 in. long, 4 ft. 6 in. high, sawed ends	1	
7/8 in. x 4 in. fascia	8	lin. ft.
1 1/2 in. x 2 in. cove	8	lin. ft.
5/8 in. x 4 in. M. & B. ceiling—to cover	12	sq. ft.
5/8 in. x 7/8 in. cove	10	lin. ft.
Living porch—		
6 in. x 6 in. box cols. 7 ft. 10 in. long, with cap and base	3	
Lattice panels, 1 ft 4 in. long, x 7 ft. 10 in high	6	
7/8 in. x 6 in. soffit	78	lin. ft.
7/8 in. x 4 in. fascia	41	lin. ft.
4 in. crown mould	41	lin. ft.

Exterior Finish (Continued)

2 in. bed mould	39	lin. ft.
7/8 in. x 8 in. frieze	78	lin. ft.
7/8 in. x 3 in. frieze	39	lin. ft.
5/8 in. x 7/8 in. cove	80	lin. ft.
5/8 in. x 4 in. M. & B. ceiling—to cover	150	sq. ft.
Flower box—		
1 1/8 in. stock with zinc lining, etc 12 in x 12 in. x 3 ft. 6 in. long	1	
Sawed wook brackets for same	2	
Louvres—		
1 1/8 in. fixed slats, frames, outside trim, etc., wire screens on back, 1 ft. x 2 ft.	2	
Windows—		
Frames complete with sash, outside trim, etc. Sash 1 1/2 in. thick, glazed D. T.		
Cellar windows. (Trim both sides). 3 ft. x 2 ft. 6 in.		
Single top hung casem sash, 4 light	4	
First floor windows—		
Single D. H. sash 2 ft. 10 in. x 4 ft. 10 in., 16 light	2	
Mull. D. H. sash, ea. 2 ft. 10 in. x 4 ft. 10 in., 16 light	1	
Single D. H. sash, 2 ft. 6 in. x 3 ft. 2 in., 12 light	2	
Mull D. H. sash, ea. 2 ft. 6 in. x 3 ft. 2 in., 12 light	2	
Second floor windows—		
Single D. H. sash, 3 ft. x 4 ft. 6 in. 16 light	5	
Single D. H. sash, 2 ft. 6 in. x 3 ft. 2 in., 12 light	2	
Shutters (1 1/8 in. thick solid paneled)—		
2 ft. 10 in. x 4 ft. 11 in. pr.	2½ pr.	
2 ft. 6 in. x 3 ft. 3 in. pr.	3 pr.	
Blinds (1 1/8 in. thick, movable louvres)—		
3 ft. x 4 ft. 7 in. pr.	5 pr.	
2 ft. 6 in. x 3 ft. 3 in. pr.	2 pr.	
Exterior door frames. (1 3/4 in. thick rabbeted) complete with outside trim.		
Front entrance frame, door 2 ft. 10 in. x 7 ft. (attached to windows)	1	
Frame for door to living porch, 2 ft. 10 in. x 7 ft.	1	
Frame for rear entrance door, 2 ft. 6 in. x 6 ft. 8 in.	1	
Exterior doors (all to detail)—		
Front entrance door, 2 ft. 10 in. x 7 ft. x 1 3/4 in. glazed D. T.	1	
Door to living porch, 2 ft. 10 in. x 7 ft. x 1 3/4 in., glazed D. T.	1	
Rear door 2 ft. 6 in. x 6 ft. 8 in. x 1 3/4 in., glazed D. T. and paneled	1	
Finished flooring—		
7/8 in. x 2 1/4 in. comb grain Y. P. 1st and 2nd stories—to cover	822	sq. ft.
Lining paper under floors	500	sq. ft.
Cement filled pipe cols. in cellar— (4 in. dia. x 7 ft. 6 in. long with caps and bases)	2	
Joist hangers. (1/4 in. x 2 in. W. I.)—		
For 2 in. x 10 in. beams	4	
For 4 in. x 10 in. beams	2	

Interior Finish

Door trim (whitewood)—		
7/8 in. jambs, 1/2 in. stops, 7/8 in. x 4 1/4 in. moulded and mitered trim. Trim both sides.		
For doors 2 ft. 6 in. x 6 ft. 10 in.	2	sets
For doors 2 ft. 6 in. x 6 ft. 8 in.	2	sets
For doors 2 ft. 4 in. x 6 ft. 8 in.	4	sets
Trim for inside of exterior doors—		
Front entrance 2 ft. 10 in. x 7 ft	1	set
Rear entrance 2 ft. 6 in. x 6 ft. 8 in.	1	set
Door to living porch, 2 ft. 10 in. x 7 ft.	1	set

Interior Finish (Continued)

Trimmed opening finished same as for doors—		
Opg. 5 ft. x 6 ft. 10 in.	1	set
Windows (whitewood)—		
7/8 in. x 4 1/4 in. moulded and mitered trim. 1/2 in. stops. 1 1/8 moulded stool. 7/8 in. moulded apron, 5/8 in. x 7/8 in. cove under stool.		
For windows, single 2 ft. 10 in. x 4 ft. 10 in.	2	sets
For windows, mull. ea. 2 ft. 10 in. x 4 ft. 10 in.	1	set
For windows, single, 2 ft. 6 in. x 3 ft. 2 in.	4	sets
For windows, mull. ea. 2 ft. 6 in. x 3 ft. 2 in.	2	sets
For windows, single, 3 ft. x 4 ft. 6 in	5	sets
Base—		
7/8 in. x 6 1/2 in. moulded	230	lin. ft.
7/8 in. x 4 in. plain (closets)	26	lin. ft.
2 in. base mould	230	lin. ft.
1/2 in. quarter round floor moulding	260	lin. ft.
Picture moulding (7/8 in. x 2 1/4 in.)	256	lin. ft.
Mantel for living room	1	Unit
Book case for living room	1	Unit
Interior doors— (2 cross panel birch veneer)		
Door 2 ft. 6 in. x 6 ft. 10 in. x 1 1/2 in.	2	
Door 2 ft. 6 in. x 6 ft. 8 in. x 1 1/2 in.	2	
Door 2 ft. 4 in. x 6 ft. 8 in. x 1 1/2 in.	4	
Scuttle to attic, 2 ft. 4 in. x 2 ft. 8 in. with trim, etc	1	
Closet shelving (7/8 in. x 12 in. pine)	20	lin. ft.
Hook strip (7/8 in. x 4 in.)	20	lin. ft.
Rabbeted shelf cleat	16	lin. ft.
1 in. dia. pipe clothes rod	5	lin. ft
Kitchen cupboard (front 5 ft. x 8 ft.) countershelf, drawers, doors, etc	1	Unit
Slat floor under laundry tubs, 3 ft. x 4 ft.	1	Unit
Main stairs 1st to 2nd story, 14 risers, 3 ft. wide, box pattern, wall hand rail, etc.	1	flight
Cellar stairs, 12 risers, box pattern, 3 ft. wide, yellow pine, wall hand rail, etc.	1	flight

General Conditions

Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges. Allow for general work not listed, such as grading, planting, etc. Include sub-bids: Hardware and applying same, painting and decorating, plumbing and gas fitting, heating, electric work.

Information about Building and Housing

FOR several years there has been developing a feeling that some agency of the Federal Government should interest itself in building and housing. The Congress of the United States made an appropriation for such activities for the year 1921-1922. The act appropriating the funds says, among other things: "That as much of this sum as necessary shall be used to collect and disseminate such scientific, practical, and statistical information as may be procured, showing or tending to show approved methods in building, planning, and construction, standardization, and adaptability of structural units, including building materials, and codes, economy in the manufacture and utilization of building materials and supplies, and such other matters as may tend to encourage, improve, and cheapen construction and housing."

Accordingly, Secretary Hoover created in the Department of Commerce the Division of Building and Housing, which co-operates with all groups interested in housing and construction, such as architects, builders, building material producers and dealers, building trades labor, contractors, builders' exchanges, realtors, building and loan associations, building inspectors, city officials, and others.

The Division has helped local communities in successfully solving their housing problems. It collects and publishes monthly prices of twenty-four items of building materials as paid by contractors in different cities. It also makes reports on building activity, such as building permits and contracts awarded, and on general building and housing conditions in the country.

Mr. Hoover has appointed two main committees which co-operate with the Division of Building and Housing. The Advisory Committee on Building Codes, with a subcommittee on Plumbing, is drafting minimum code requirements for building construction. The Advisory Committee on Zoning is making studies of state enabling acts and zoning ordinances. Its reports should be of distinct aid to communities interested in the promotion of the public welfare and the protection of property values.

Depreciation of Buildings

THE Chamber of Commerce of the United States is conducting an investigation to determine the rate of depreciation of various structures, machinery, etc.

For frame buildings used in mercantile pursuits a 5 per cent. depreciation per annum was considered a fair average. Brick buildings are figured at 2½ per cent. and concrete buildings at 2 per cent. Motor truck depreciation was figured at 22.2 per cent. and other delivery equipment at 15 per cent., while wagons and other horse-drawn vehicles averaged 4.3 per cent.

The committee's work will tend to bring out some very valuable information that will be useful to every contractor and BUILDING AGE AND THE BUILDER'S JOURNAL will publish this matter as soon as definite figures are available. Data of this kind will be valuable, when one is figuring up the income tax returns, etc.

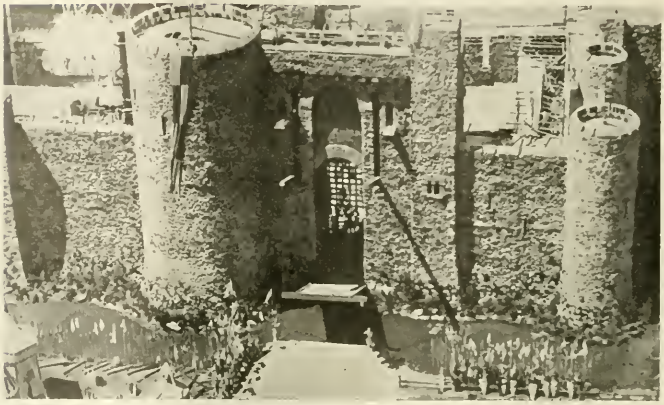
In the case of brick dwellings, a large fire insurance company figures this depreciation at 2 per cent. per annum for a period of 25 years. After that it is considered that the old building has a permanent value of 50 per cent. of its replacement cost.

The Movies Call for Aid

Remarkable Construction Work

BUILDING construction on rather an elaborate scale was necessary in the preparation of the "sets" for the new movie production Robin Hood that Douglas Fairbanks is now preparing. The pictures shown here of the construction work for the complicated "scenery" cannot fail to be of considerable interest to everyone in the building industry.

The principal scenes are laid in and around an old Norman Castle of the Twelfth Century. Any student of architecture who has read about these ancient castles will remember that they are built of stone, many feet thick, and were of enormous size. A castle in the old days was both the town and fortress and for its protection from marauders it was surrounded by a moat.



Practical Portcullis, Drawbridge and Moat. Compare Gigantic Size of Towers and the Players.

Mary Gives Doug a Few Suggestions About Building Construction



There was usually only one entrance and this was reached by a draw bridge and further protected by a huge iron gate or "portcullis," as it was called, which was raised or lowered at will. It must be remembered that these had to be worked by man power as it was before the days of gun powder, steam or gasoline, and when we view some of the construction that some of the old timers did, we really have to marvel at the wonderful results that they secured with practically no equipment. Today modern building construction makes use of many different mechanical principles and technical processes.

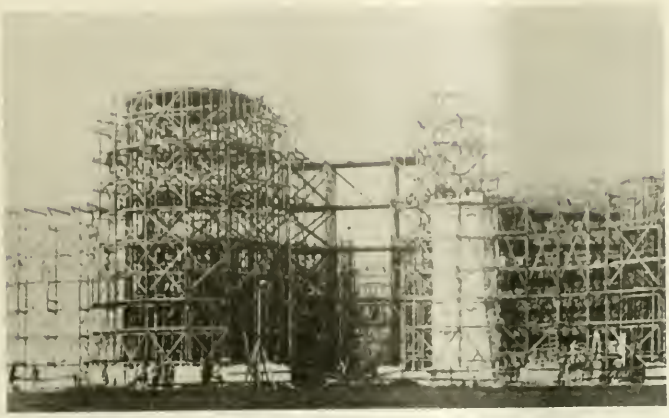
To obtain the right atmosphere as a background for the actors in a production such as this movie of Robin

Airplane View of the Large Motion Picture Set Built for Douglas Fairbanks in "Robin Hood"



on the Building Industry

for Large Moving Picture Set



Some Remarkable Scaffolding Was Necessary for This Construction

Hood, many structures have to be erected. The old castle shown in these pictures is of considerable size and many difficulties had to be overcome in its erection. Of course, being for temporary use only, it is not of stone construction, but was built of a wood and steel frame-work and covered with sectional pieces of stucco work fashioned so as to resemble stone.

This castle is 620 feet long and in parts 310 feet high, and is composed of 8 towers with the usual curtain building between. The ground area covered is over 2½ acres in extent. In its construction 400 workmen were employed and the lumber if laid out in board feet would cover 20 acres of ground, or if placed end to end, it would span a distance of over 400 miles!

A carload of 30 tons of nails were used in its construction, together with 250 tons of plaster, 1,500 bags of cement, 178,000 square feet of wall board and stucco lath and 25,000 lbs. of fibre was used in the plaster. The actual construction work was accomplished in about 12 weeks, although many months were used in preparation.

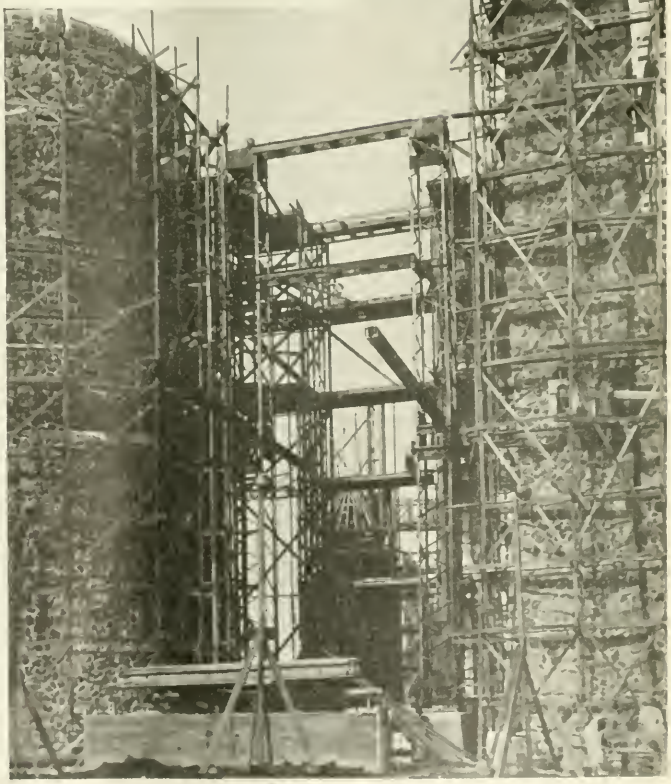
One interior scene is taken in the great hall of the castle; this is a room larger than the concourse of the Pennsylvania Station in New York City, which is considered the largest room in the world. The banquet hall in this movie castle, however, has no roof, being open for the proper lighting of the picture.

One of our interesting pictures shows the construction of the castle walls. An idea of their height can be had from the number of divisions in the scaffolding compared with the height of the workmen. As an interesting example of scaffolding, this picture will be of great interest to builders.

This hole in the wall, filled with scaffolding, was later closed by a drawbridge built especially for the movies. It is made of structural steel and over it will ride Douglas Fair-

Close-Up View Showing the Use of Steel for the Drawbridge Support





banks bound for the Holy Land with Richard the Lion Hearted and his horde of Crusaders.

The bridge is an innovation, for it is said to represent the first use of structural steel in motion picture construction. Perhaps it predicts the building of skyscrapers of steel and stone especially for the movies. The old Norman castle of which the bridge is a part, is said to be the largest set of its kind ever built for the moving picture camera.

In the good old days the drawbridge and counterbalance beams were made of heavy oak timber and the raising of portcullis and drawbridge was accomplished by man power. Of course, a counterbalance was used, but even then it required the muscle power of a good many men to work these protecting doors. In this modern movie castle the old-time methods would of course be too slow and cumbersome so a 24 horse power electric drum hoist operates the drawbridge and it is simply worked by the director pushing a button! What would Robin Hood and any of his band have thought of such a contrivance in those jolly old days?

Builders can learn quite a good deal from an examination of these pictures that will be of considerable interest to them. Building is bound to play an important part in the movies of the future, and likewise the movies will also play an important part for building construction.

The gathering of historical facts is by no means a small job, but when Doug. and Mary are spending about a cool half million on a super-production as they are on Robin Hood, it is certain that proper search would be made back into history for the right material to present a truthful portrayal of the buildings, furniture, clothes and customs used at the time.

Doug. has gathered about him experts in every line. First of all he secured the services of specialists in research work, men who are considered the foremost authorities on history during the twelfth century. Dr. Woods, considered the best informed authority on this period in the country, heads this work at the Fairbanks Studios.

It was necessary for Dr. Woods and his assistants to search through no less than one hundred and forty-six books for material in order that this great picture might be an exact portrayal of Mediæval England during the 12th Century.

It is readily seen that time, money and real brains were necessary when Fairbanks made up his mind to do Robin Hood.

Door Opener *for* Garage

OPERATING the garage door without getting out of the car is an advantage that every car owner will appreciate.

Here is a picture of how the scheme has been worked out in quite an elaborate private garage, but the same scheme can be applied to the modest one-car garage of the ordinary type.

The scheme is very simple and any builder can work out the details to fit any particular case.

An idea of this sort can be worked by having a chain attached to the door and have it slide over two pulleys. It will work on one or two sliding doors, also on swinging doors.

The alert builder who will use an innovation like this will be the man that will get the reputation for being up-to-date in his calling.

The picture shown here is that of the garage attached to the residence of Mr. Claire Briggs, located at New Rochelle, N. Y. This is a large private dwelling in old English style, a combination of stone, brick and stucco with half timbered effects.

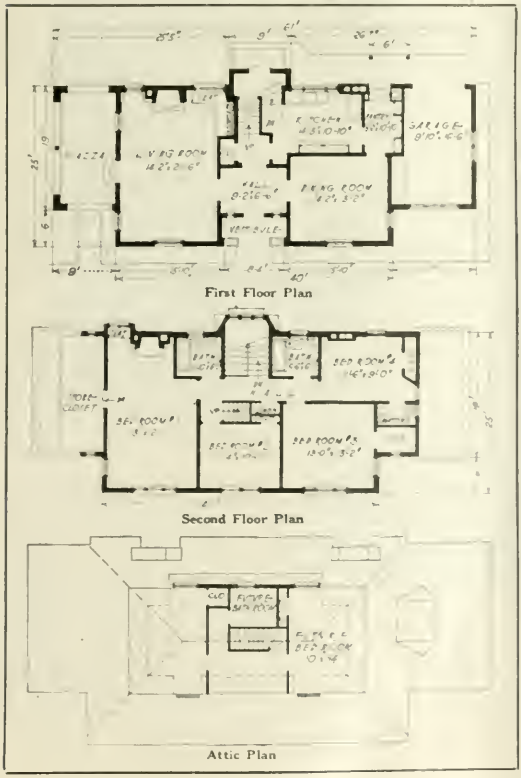
The garage door carries out the old English idea in all its details. It is an interesting example of some of the building problems that contractors meet in their everyday work.



The House on our Cover



ARTHUR
LOOMIS
HARMON
Architect



UNUSUAL in its exterior treatment is the house shown above, also on our front cover this month. The design is a little different from the great majority of houses that are now being erected. Some of the old houses of England suggested the treatment that the architect has so happily evolved in this design.

This house has been built of brick. The portions that are stuccoed have been depressed about an inch so that the finished stucco and visible brick-work are in the same plane. A garage is included in the house proper. It is carried out in the same style and corresponds with the piazza; English half timbered work at these two portions gives a very pleasing contrast with the main portion of the house.

The roof lines are rather distinctive; it is simply a hipped roof, but the treatment at the dormers and the hooded portions over the windows give the distinctive touches that make the house original in its design.

The garage does not appear so from the street as it looks like a portion of the house. It is entered from the rear as the plan shows: there is no direct entrance from the house, which is really a desirable feature, but there is a convenient rear entrance from the pantry, which is covered over, affording suitable shelter in bad weather.

This house was built for Mr. Harvey W. Bell, New York, from plans prepared by Arthur Loomis Harmon, architect, of New York. The builder was Mr. Ernest Peherens, of Irvington, N. Y.

The room arrangement is rather novel; all rooms being readily reached from the hall, both up and down stairs. Two bathrooms are located on the second floor and a very desirable feature is that they can be reached from the hall. In some houses bathrooms can only be reached from the bedrooms and this feature is sometimes very undesirable when visitors call.

Remodeling *of* Commercial Building

Modern Front Built on Structure That Projected Beyond Building Line

C. A. ZIEGLER, Architect

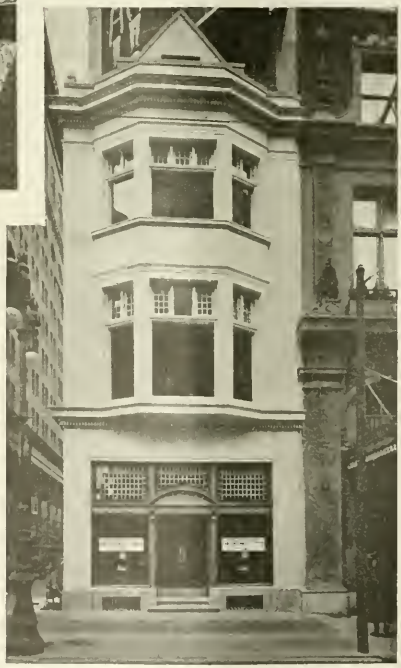


IN the old days different cities had building lines, stoop lines or area lines. All sorts and manners of projections extended beyond the building line. There was no firm or fast rule or regulation of what should not be done beyond the line and within the area line. Years ago this condition existed in practically all large cities, and bay windows, etc., all encroached beyond the building line.

In recent years, a large hotel was built in Philadelphia, adjoining one of these old buildings hat projected beyond its building line. The brick wall at the side of the hotel projected about five feet beyond the hotel front and to prevent this from being an eyesore, it was faced with limestone. When litigation for the removal of the encroaching portion of this building was settled, the old front had to be removed. Of course, it could have gone back pretty near in the self-same shape, but as the building was on the prominent corner of Philadelphia at 132 Chestnut St., it was advisable from a financial point to make a high class looking job while they were at it.

Through the efforts of the architect, Mr. C. A. Zeigler, a very interesting and artistic remodelling job was done. The new front is built of limestone on a polished granite base.

The idea of the bay window is a novel one in a commercial structure. The small casement sash used for the transom, provides means for ventilation. The large windows are of plate glass. The store front is of cast iron, artistically painted in bronze-like effect. Above the plate glass show windows and entrance doors prismatic glass transoms are used.



Remodeling of buildings that have outlived their original usefulness offers a profitable field of work for contractors

Remodeling buildings that have outlived their original usefulness offers a very profitable field for securing business for the building contractors. By making certain alterations in buildings they can again be turned into a profit maker and for this reason it would pay to do so.

In every city and town there are a number of such buildings. Perhaps an old dwelling can be altered and converted into a store; if it is set back a distance the store can be built in front of it with an entrance to one side leading into the old structure. In other classes of buildings the fronts only need to be altered. In some structures, especially on city streets, it is necessary to do a good deal of shoring to support the super-structure while a new store arrangement is built underneath.

Frequently the old floor is a few feet above sidewalk level, while the modern store demands a floor level not higher than one step; in fact, in the more progressive stores, no steps are used at all but just enough incline to drain the rain towards the street.

When a floor has to be dropped as mentioned in the above case, a new foundation wall may be built on each side at the required height for the new level. The joists are then cut and the entire floor lowered to the new position.

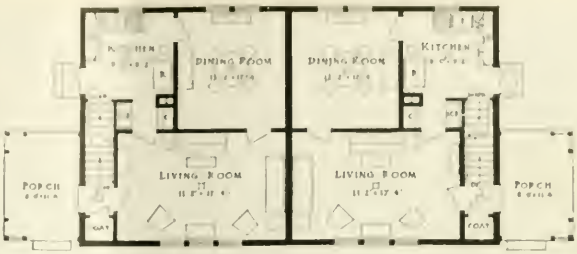
In cases where a cellar does not exist and the foundations go down only 3 or 4 feet, a high cellar can be made without much expense by building a retaining wall inside of the old foundation. This only takes off a few square feet from the cellar floor, but it saves a good deal of expense for underpinning if the original foundation wall is to be deepened.

Twin House Design

MURPHY & DANA, Architects

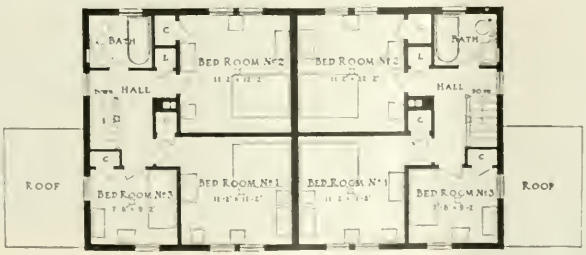
THERE is a certain economy in building a twin house besides improving the exterior appearance, as a more pretentious appearing building is the result.

The interesting example shown here is of frame construction covered with stucco. The lattice treatment adds just the ornamental touch to relieve the plainness.



First Floor Plan





Second Floor Plan

The belt cross carrried around above the first story windows and in line with the porch roof forms an interesting dividing line between the two stories.

Each house contains six rooms, very conveniently laid out, proper attention having been given to secure adequate room for the necessary furniture.

This interesting house was one of a number built at New Britain, Conn.

ATTRACTING

How a Progressive Successfully



Flashlight View of the Crowd Waiting for Admission at Night

HOME owning interest can be capitalized to a wonderful degree by the speculative builder. The idea of having a sample house completely furnished is not a new one, but it can be carried in such a complete manner so that it will result in some very valuable advertising.

Successful salesmen in the building line know the psychological effect that a crowd has on the man and woman who really want a home. They mingle with the crowd, viewing the different rooms and hearing with rapt attention all the nice remarks about how the rooms are furnished and laid out, and they hear many suggestions from this or that one as to how they would have had it, if they would own it. Sales under these conditions are made under the best possible conditions. The speculative builder is here in the same position as any other merchant with goods to sell.

A fine piece of furniture displayed in a junk shop would not command so good a price as if properly displayed in a furniture store window where its beautiy would be enhanced by a suitable background.

Usually builders have only their services to sell, but quite often they will build a house for speculative purposes so as to make extra money on the side. Frequently this leads to building on rather a large scale, and it is interesting to know how some successful builders in this line have sold their product.

A most remarkable example of the model house idea was recently used in Baltimore very cleverly by Mr. George R. Morris. There it was successful as advertising is evidenced by the fact that over 27,000 people visited this furnished house! During the inspection period is was open both day and night, and needless to say this great number of people talking about it, was worth a great deal of money and as all of the buildings erected were successfully disposed of the publicity certainly was good advertising.

Mr. Morris some years ago bought a tract of land which had formerly been part of an old homestead on the outskirts of Baltimore. He divided this into streets, put in sewers, sidewalks, curbs, etc., and erected quite a number of different homes and called the place "University Homes."

Several of the different buildings in this group were described in our

The Entrance Hall Was Simply But Tastefully Furnished So as to Impress the Visitor with a Warm Welcome





The Living Room Was Comfortably Furnished—A Large Davenport Faced the Fireplace and a Glimpse Is Had of the Sun Parlor

THE CROWD

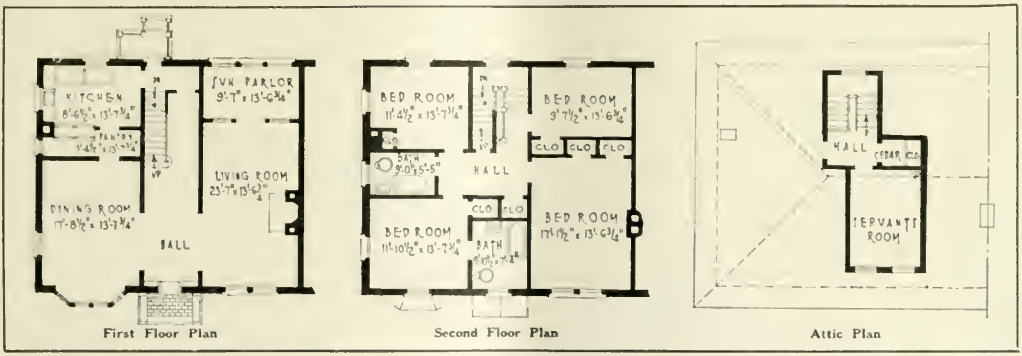
Baltimore Builder Sold Houses

May issue. It is a community development, different in many respects from anything ever attempted in Baltimore or for that matter anywhere else in the country, and the successful methods employed to profitably and quickly dispose of these houses will give many a good idea to our readers.

Mr. Morris was an architect who branched out into the speculative building business and he has made a big success of it; this home development is the result of his years of experience in designing and operating apartment houses as well as building a great many individual homes. By close contact with his customers he learned just what the majority of the



Photograph of the Model House That Attracted the Crowd



First Floor Plan — Second Floor Plan — Attic Plan

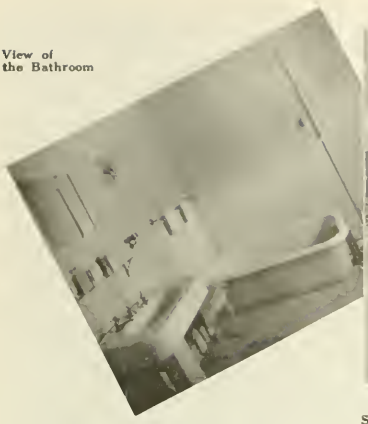


In the Dining Room, the Table Was Tastefully Set Just as if It Were Ready to Serve a House Party

View of the Attractive Sun Parlor at the Rear of the Living Room This Was Neatly Furnished in Livable Style



View of the Bathroom





Sambo the Cook of More Than Little Size Sure Finds the Kernarator a Great Invention for Disposing of the Garbage

View of the Kitchen



people wanted in the way of a desirable home at a moderate expenditure.

We present herewith a very interesting group of pictures of one of the houses in "University Homes" that was fitted up as a model house. This was one side of a twin house, as for economy's sake the houses were built semi-detached.

A very interesting picture is the flashlight taken one night, showing the crowds waiting for admission to view the interior. Some small advertisements were inserted in the local daily papers in the real estate section calling attention to the fact that an ideally furnished model house was open free for inspection to anyone who might call. On some days the crowds were so great that they had to form in line to wait for admission.

With the cooperation of different firms in Baltimore, the house was completely decorated and furnished so that it had an absolute home-like appearance. In some model houses, handsome furniture and rugs are all placed down in a certain artificial way, and with a prominent tag on each, and this, while attractive enough, chills the homelike effect. No such eyesores appeared in the model house of Mr. Morris's. Instead, an attractive, well printed 32-page booklet, size 5½" by 8", was presented to each visitor. This booklet had a title, "The Ideally Furnished Home." It contained a picture of the house and a short description of the development. Then came an itemized list of each room, listing every article of furniture, etc., and from whose establishment it came. A visitor could go about each room and a look at the booklet would tell them just exactly where each piece of furniture, linen cloth, etc., could be had.

In furnishing up the house, the home touch was always brought out strong. Little toilet articles were on the dressers in the bedrooms, and clothes were hung in the closets. The idea was to create the impression that it was a real livable house. It was just the human touch that was needed and many a lesson on successfully selling houses can be learned from this.

The booklet contained a number of advertisements of different firms who furnished material and furniture for the house and the money derived from this source paid for the cost of the interesting booklet. Every copy went into the hands of an interested party and it was a successful example of cooperative work throughout.

We also present with the pictures a plan of the floor arrangements. This plan shows the opposite side of the twin house, both are identically the same, except reversed.

View of Cedar Lined Closet Located in Attic





View of Bedroom

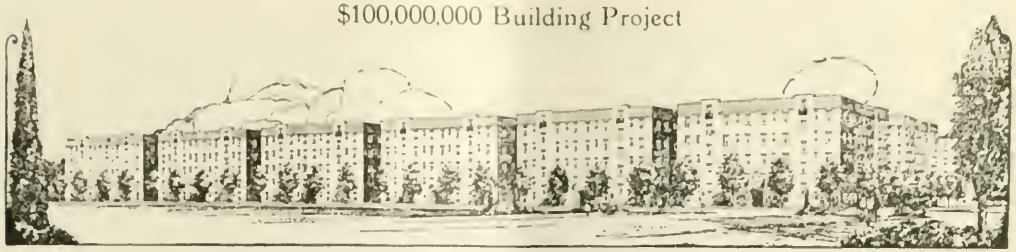
The Moth Proof Closet Was a Feature that Appealed



Another Bedroom

MODERN APARTMENT BUILDINGS

The Start of the Metropolitan Life Insurance Company's $100,000,000 Building Project



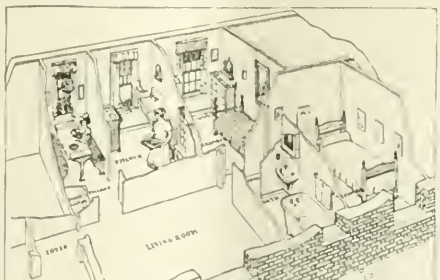
WORK has commenced on four groups of apartment houses in the Astoria section of the City of New York in the huge home building program of the Metropolitan Life Insurance Company.

Mr. Walter Stabler, the company's comptroller, informs us that the contract is for total guaranteed cost not to exceed $6,500,000. This includes the contractor's fee of $5,000 a house and the architect's fee. Mr. Stabler declared he expected the cost would be less than the maximum amount and any reduction over charges would go to reduce the rents. In any event, even if the full $6,500,000 is spent the rental will be $9 a room.

In announcing the completion of plans and the award of contracts, the Metropolitan Company calls attention to the fact that the earnest co-operation of labor and the large scale reproduction of the unit house will enable the company to rent the houses at not more than $9 a room, as specified in the law, and cover operating expenses, return 6 per cent. interest on the investment, and amortization.

Mr. Andrew J. Thomas is the architect for these model apartment houses and Mr. Stabler, who has charge of this huge project for his company, is enthusiastic about the plans and gives Mr. Thomas considerable praise for creating a model plan. Mr. Stabler said: "His vision, his initiative and his untiring efforts have combined to make these buildings a model for future development. The Metropolitan's own architect, D. Everett Waid, has been associated with Mr. Thomas in a consulting capacity, but the ideas, the plans, are all those of Mr. Thomas."

Pictures accompanying the description of the new houses show the architectural beauty of the exterior block, the pleasant parked courts and the extensive use of the "Pullman"—an eating nook separate from the kitchen and not encroaching upon the functions of the living room, the old style dining room having been eliminated from the majority of the apartments, more convenience in less space.



What may not seem so obvious from a glance at the architectural drawings, but of even more significance, is the fact that the buildings occupy only 50 per cent. of the land area. In other words, half the space on the block—which is 600 feet long and 200 feet wide—is open. The Tenement House Law demands that only 30 per cent. of the area be unoccupied.

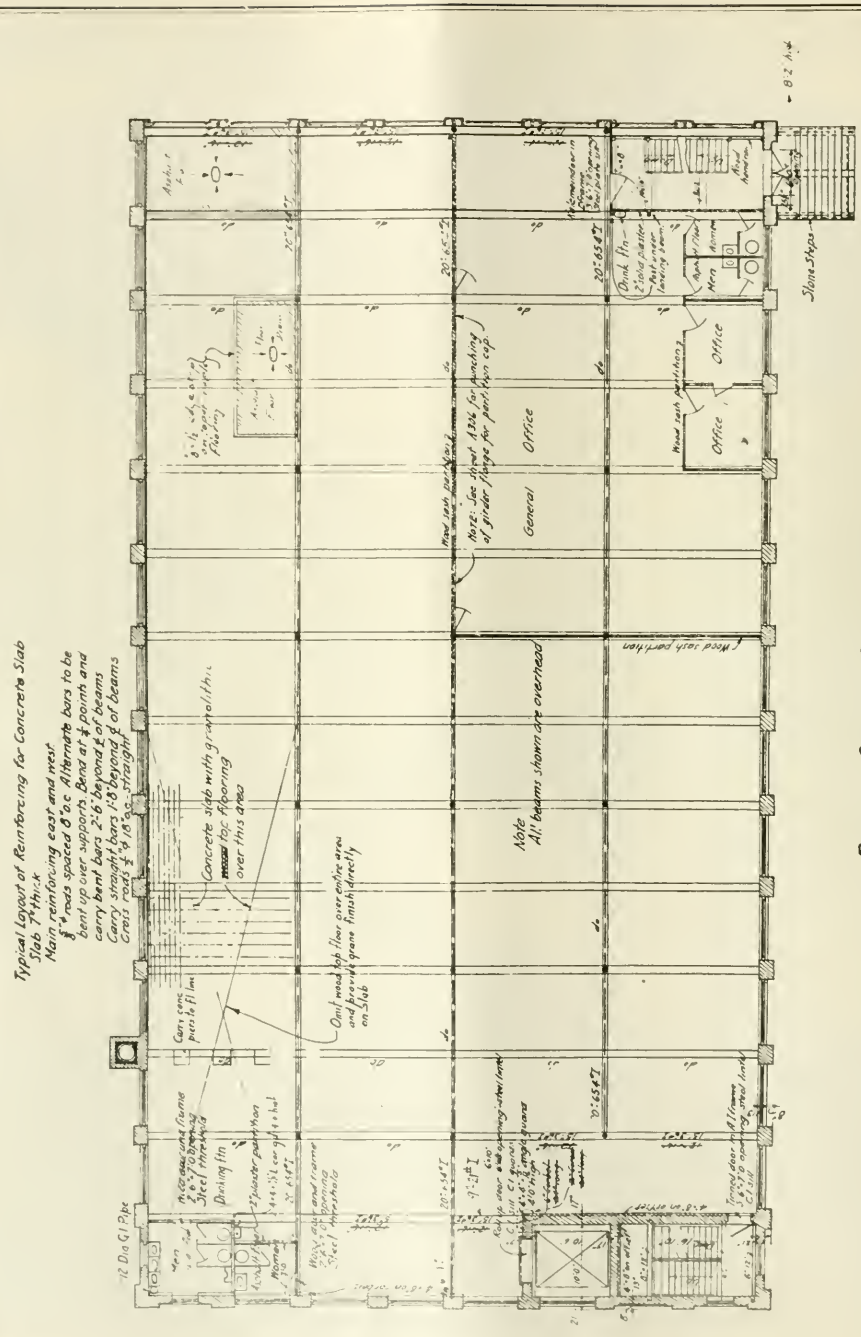
Another feature in which Mr. Thomas's plans are far more generous than the requirements of the law pertains to the size of the rooms. Every room is far in excess of the minimum specifications of the law, as is the general block development.

Apartments are four, five, and six rooms, Mr. Thomas being able to break away from the three-room plan, which he declares is "definitely below the American standard of living," only after long study. Every apartment will have at least two bedrooms—assuring the privacy which a civilized home life demands—a living room and a kitchen. Some will have additional bedrooms and dining rooms.

The four-room apartments will be equipped with the "Pullman," a cozy corner with a stationary table and benches on either side. A window looking out upon the street or the parked courts gives light.

Every one of the 8,250 rooms will look upon a street or court. Between the two rows of houses forming each block will run a great interior garden thirty-six feet wide and 600 feet long. This central park will be seeded and planted with shrubs and flowers in accordance with the principles of good landscape gardening that will accord with the design of the houses.

Within each individual house, which will be built in the form of a U, will be a large garden, 40 feet wide by 154 feet long. These gardens will intersect the central court. At a third opening are the passageways every 100 feet between buildings. All these courts and passages bring outside light and fresh air into the buildings.



PLAN OF SECOND STORY

LOCKWOOD, GREEN & CO., Engineers

Future Extension and Use Considered in Modern Factory Design

By SAMUEL B. LINCOLN



FACTORY buildings, like other structures, sometimes serve entirely different uses than what they were originally planned and built for. To build a structure that can be used for only one thing is apt to cause quite a financial loss should there be a change in the industry for which it was erected. Builders should have this in mind when they are submitting designs or called in consultation with the owner of a proposed factory or any other commercial project.

Everyone is familiar with the changes in certain business streets that have occurred in a number of our large cities.

In this connection the design of the modern brick factory building presented in this issue will be of considerable interest, as there are several very unusual features about this design.

After occupying rented quarters for a number of years, the Shambow Shuttle Co. of Woonsocket, R. I., had constructed during the past year an entirely new plant to house their business and to enable them to give better service to their customers.

Work was started in July, 1919, and the new plant was substantially completed so that moving into the same was completed about January 1, 1922.

In the first place, the owners decided that, since Woonsocket was a rapidly growing worsted center, it would be good business foresight to construct so that should they at any time wish to move their shuttle business away from Woonsocket, the building could be readily converted into a worsted spinning mill.

This thought has been kept in mind both in the design and construction, with the result that while this is a very fine shuttle factory it also could be converted with practically no expense into a good worsted mill.

Unusually complete provisions have been made for future expansion of the building in either of two directions. The building is constructed at present to a height of three stories and has been arranged for the future addition of two more stories. One temporary end has been built into the building so that at some later date the building may be practically doubled in length on the ground available and now owned by the Shambow Shuttle Co.

For this reason the entrance has been placed to what is practically one end of the building; in the completed structure, as contemplated, this main entrance will be in the center and will then give a well balanced appearance to the entire structure.

The temporary frame enclosure on the one end can be easily torn away when the addition is built and roofed over, but the appearance of the existing structure is complete.

Lockwood, Greene & Company of Boston were the engineers and the general contractor was the Eastern Construction Co. of Woonsocket, R. I.

Designs of this type of building are of interest especially at the present time, as there has been a considerable increase in the number of industrial buildings in demand. During the month of May, twenty-three million dollars worth of contracts were let for various industrial buildings. This is a very gratifying sign of the times, and indicates that the business revival is now going forward throughout our country.



Modern Good Looking Barns Replace the Ugly Type

A Little Ornament Judiciously Placed Transforms an Otherwise Plain Structure Into One of Beauty

FARM improvements are steadily developing. The old time farmer of fifty years ago would certainly marvel if he could visit one of the up-to-date farms and see all the modern conveniences and the attractive looking buildings.

The dreadful monotony has been dispelled by the automobile and the wireless phone. Farm homes now contain many modern improvements so as to give the women folks, also the men folks, all the advantages that the city dweller enjoys. More attention is being paid to the beauty of the buildings. Of course, it is necessary that they be well constructed so as to serve their purpose, but little thought has been given in the past to make them good to look at. It will therefore be of interest to our readers to examine the three pictures shown herewith, of the large dairy barn belonging to Mr. J. T. Towner and built at Torresdale, Pa.

This is a large stucco covered barn which is well lighted, and the windows placed so as to obtain a pleasing architectural effect. The doors with crossed timbering in the panels form interesting details of the completed structure. The large hay door is similarly treated. In the ordinary type of barn this is usually an ugly looking construction. Here it is pleasing.

Besides the practical metal ventilators, the central one has been covered with an ornamental tower with louvres, this adding a good deal to the appearance of the barn.

The large gable end and silo tops have been effectively handled by means of half timbered work.







CONTRACTING EQUIPMENT

Reliable Information on Time and Labor Saving Devices

Economical Operation *of* Hoist

FOR four years we have been using a 6 H.P. gasoline engine with a platform hoist, and have found it by far the best, quickest and most economical method of hoisting material for building construction work," says Mr. Peter Guthy, Jr., of Peter Guthy, Inc., 852 Monroe St., Brooklyn, N. Y.

Since its purchase our outfit has worked on several large buildings, besides different jobs of smaller size. It worked for about 4 weeks on the Brooklyn Hebrew Home, for 6 months on the Riviera Theater building, and for 2½ months on the church of the Seventh Day Adventists. At present it is operating on a building which we are constructing for the J. H. Meyer Company at Howard and Dumont Avenues, Brooklyn.

On these jobs the outfit was used for hoisting brick, concrete, terra cotta blocks, beams, stone and lumber. The concrete is mixed in a mixer on the ground and dumped into a barrow, which is then wheeled onto the hoisting platform and raised by the engine. At the top the barrow is wheeled off by a workman who handles all material from the hoist. Only one man is needed here.

When hoisting lumber, the outfit works only at intervals because of the large amount of sawing required. On a brick hoisting job, however, it has to work steady all day long, and easily keeps a gang of 20 men busy laying bricks. Of course only half of these man are bricklayers, the other half being helpers. The outfit hoists an average of 15,000 bricks a day in addition to barrows of mortar as needed.

ANALYSIS OF OPERATION

Units handled daily, 15M brick.
Period covered, 1 day.
Hours operated, 8.
Estimated life, 6 years.

Investment and Depreciation

Cost of outfit (including freight)	$586.92
Cost of additional equipment	.....
Total depreciation yearly...	97.82
Depreciation prorated for daily period	.65

Fixed Expense

Average interest at 7%.....	$23.97
Maintenance and repairs on engine	60.00
Maintenance and repairs on outfit (new cable).....	9.56
Total yearly fixed expense	$93.53
Expense prorated for daily period	.62

Variable Expense

Fuel cost, 2½ gals. @ 27c..	$ .68
Lubricating oil, .14 gals. @ 50c	.07
Total for daily period....	$ .75

Labor Cost

Operator ($7 per day) ...	$7.00
Helper ($7 per day).....	7.00
Total for daily period....	$14.00

Summary

Depreciation	$ .65
Fixed expense.....	.62
Variable expense.....	.75
Labor	14.00
Total cost daily expense.	$16.02
Total cost per M brick..	$1.07

Since our first outfit is still in operation after 4 years' use, we believe it is good for at least 6 years in all, and are depreciating it on that basis.

On the average job the engine uses 15 gallons of gasoline in 6 days, or 2½ gallons a day, and an average of about .14 of a gallon of oil per day.

It must be kept in mind that these costs include the full time of two men. The operator at the bottom of the hoist not only tends to the engine —which really requires very little attention—but also loads the platform with the barrow and other materials, and operates the hoist. The helper at the top of the hoist unloads it and delivers the material around the building as needed. The wages of these men amount to $14 a day, or ⅞ of the entire operating cost, leaving only $2.02 per day as the actual cost for depreciation, repairs, fuel, etc., for the equipment. Two men are required on almost any hoisting outfit; but with the Novo they can give practically all their time to handling the material.

On these hoisting jobs it would be possible to use horse power or hand power, but both are too slow and expensive. We use the outfit on jobs up to 6 stories in height; but we have never tried horses except for one-story buildings, and have not used hand hoists at all.

On account of the satisfactory performance of our first hoisting outfit, consisting of a Novo engine, we purchased another one a short time ago. The original had been in operation four years and needed an overhaul, so we thought it advisable to purchase another one. The new equipment has proved as satisfactory as the original.

OFFICE and JOB MANAGEMENT

Things the other man has found out that save money



Estimating Materials *for* Masonry Work *and* Concrete Construction

By I. P. HICKS

SINCE many materials are now bought and sold by the ton (2,000 lbs.) and by the 100 lbs. instead of by the cubic yard and the cubic foot, it becomes necessary to have a basis for quantities by the ton and by the 100 pounds.

As many parts of concrete and cement construction are figured by the cubic yard, cubic foot and square foot of surface for given thicknesses, there is much need of a ready method to determine the weight and quantities of material required for such work.

To meet this demand we have arranged the following data, which will enable the contractor to readily determine the quantities of material required for the different kinds of work as described. In the mixtures of materials, Portland cement is figured 100 lbs. per cubic foot; sand, 100 lbs.; broken stone, average size 1 inch diameter, 88 lbs. In the mixing of materials the quantities are to be taken by volume unless otherwise stated. In most cases the mixing of materials is by volume, but in the estimating for buying, it is often necessary to know the weight of the materials in order to purchase the correct quantities.

Quantities of Materials for One Cubic Yard of Concrete

Mixture Proportions	Sacks Cement	Sand Tons	Stone Tons
1 : 2 : 3	6.33	0.63	0.95
1 : 2 : 4	5.50	0.54	1.08
1 : 2½ : 5	4.50	0.56	1.11
1 : 3 : 5	4.20	0.63	1.05

Material Required to Lay 100 8"x8"x16" Cement Blocks Using 1 to 3 Portland Cement Mortar

Portland cement, 1.75 sacks; screened sand 600 lbs. Cement blocks required per cubic foot of wall, 1.68. Cement blocks can also be figured 1⅛ blocks per square of the surface measurement for an eight inch wall. A wall faced with 4" 8" x 16" blocks can be figured by the same method, 1⅛ blocks per square foot of the surface to be faced.

Materials Required for 100 Square Feet Cement Floor—Base Coat

Thickness Inches	Mixture Proportions	Sacks Cement	Sand Tons	Stone Tons
2"	1:2:3	4.00	0.38	0.58
2"	1:2:4	3.25	0.34	0.67
2"	1:3:5	2.60	0.39	0.65
2½"	1:2:3	5.00	0.47	0.73
2½"	1:2:4	4.16	0.42	0.83
2½"	1:3:5	3.25	0.49	0.81
3"	1:2:3	5.83	0.58	0.88
3"	1:2:4	5.00	0.50	1.00
3"	1:3:5	4.20	0.60	0.98
3½"	1:2:3	6.76	0.68	1.02
3½"	1:2:4	5.80	0.58	1.16
3½"	1:3:5	4.50	0.68	1.13

Mortar Colors per 1,000 Brick Approximate

Red, windsor, terra cotta, amber, seal, fern, green and salmon, 50 to 75 lbs.

Buff, brown, colonial drab and French grey, 40 to 60 lbs. Black 30 to 60 lbs.

Materials Required for 100 Square Feet Cement Floor—Finish Coat

Thickness Inches	Mixture Proportions	Cement Sacks	Sand Tons
½"	1 to 1	3.40	0.12
¾"	1 to 1	5.12	0.18
1"	1 to 1	6.80	0.24
½"	1 to 1½	2.72	0.14
¾"	1 to 1½	4.08	0.21
1"	1 to 1½	5.44	0.28
½"	1 to 2	2.24	0.16
¾"	1 to 2	3.36	0.24
1"	1 to 2	4.48	0.32
½"	1 to 3	1.57	0.24
¾"	1 to 3	2.00	0.36
1"	1 to 3	3.14	0.48

Magnesite Stucco Materials for 100 Square Yards

Thickness	Stucco, pounds	Chloride solution
Scratch coat, ¼"	1,600	56 gallons
Finish coat, ¼"	1,600	56 "
Dash rock	1,000	

Cement Stucco Materials for 100 Square Yards

Mixture Proportions	Thickness	Sacks Cement	Sand tons
1 to 2	¼"	20	2.00
1 to 2	¾"	30	3.00
1 to 3	½"	16	2.16
1 to 3	¾"	24	3.24
		Dash rock	0.50

Materials for 100 Square Yards Plastering—U S G Hardwall Plaster

Materials	On wood lath	On metal lath	On Sacket plaster Brd.	On brick and tile walls
Sacks plaster	10 to 11	16 to 18	8 to 9	14 to 16
Sand pounds	2,700 to 3,000	3,300 to 4,500	2,300 to 2,500	3,800 to 4,000

For the white coat, 1 barrel of lump lime or 5 sacks of hydrated lime, and 100 lbs. of finish plaster.

4-foot lath 1,500, 32-inch lath, 2,000 will be required for each 100 square yards. Lath nails required 8 lbs.

Material to Lay 1,000 Brick ⅜" Mortar Joint

Mortar 1 part lime putty and 2 parts sand. 1¾ barrels lump lime and 1,500 lbs. sand.

Mortar 1 part lime putty and 2½ parts sand. 1⅜ barrels lime and 1,500 lbs. sand.

Hydrated lime mortar, 1 part hydrated lime and 2 parts sand. 6½ sacks hydrated lime and 1,500 lbs. sand.

Hydrated lime mortar, 1 part hydrated lime and 2½ parts sand. 5¾ sacks hydrated lime and 1,500 lbs. sand.

Lime, sand and cement mortar, 1 barrel lump lime, 1 sack Portland cement and 1,500 lbs. sand.

Or, 4 sacks hydrated lime, 1 sack Portland cement and 1,500 lbs. sand

Cement mortar, 1 to 3 Portland cement. Portland cement 5 sacks, sand 1,500 pounds.

Approximate Weight of Masonry Building Materials

	Pounds
Sand per cubic foot	100
Gravel per cubic foot	100
Crushed rock per cubic foot	88
Portland cement per cubic foot	100
A sack of cement weighs	94
Usually figured 1 cubic foot	
Lump lime per barrel	180
Hydrated lime per cubic foot	40
Hydrated lime per sack	50
Hard wall plaster per sack	100
Stucco plaster per sack	100
Common brick per cubic foot	125
Press brick per cubic foot	150
Limestone and marbles per cu. ft.	168
Granite	170
Sandstone	151
Bluestone	160
Quartz	165

Weight of Masonry

Concrete per cubic foot	140
Common brick work	120 to 130
Press brick work	140
Granite and limestone rubble	154
Sandstone rubble	145
Mortar, hardened	103
Plaster, square yard on wood lath	27 to 33

Materials Required to Lay up 1,000 Pieces Hollow Tile

One part Portland cement with 20% hydrated lime added and 3 parts sand.

Size of tile	Thickness of wall	Sacks of cement	Tons sand	Lime Or re-Dry lump quir-hydrated lime lbs.	Lime re-quired to make putty cubic feet	Putty make lbs.
4"x5"x12"	4"	6.33	0.95	51	1.25	39
4"x5"x12"	5"	7.60	1.14	61	1.52	47
8"x5"x12"	8"	12.00	1.81	97	2.42	75
4"x5"x12" and 8"x5"x12"	12"	21.60	3.24	173	4.33	133

Comparing the Sizes of Tile with Brick.

4"x 5"x12" tile	equals	3	bricks	
8"x 5"x12"	"	"	6	"
4"x12"x12"	"	"	7	"
8"x12"x12"	"	"	14	"
12"x12"x12"	"	"	21	"

Novel Method *of* Hanging Sash

New Use for Spring Sash Balances

SLEEPING porch windows should be fixed in a manner so that the full opening can be had. A means must be found where the sash can be rapidly and easily closed and opened.

A heavy wind usually awakens the sleeper and the closing of the windows on the windy side of course prevents this annoyance. The same is true of a rain storm; this is why it is desirable to have an easily operated sash.

The picture shown herewith is the scheme of an ingenious home owner who had the sash hinged on top and counter-balanced by ordinary spring sash balances. The idea of using the spring sash balances in this position will be new to most of our readers, but in this case it has worked out very successfully.

This ingenious method was used by one of our subscribers, Mr. William H. Force, Jr., on his own residence at Madison, N. J.





CARPENTRY

Good Practice in Frame Construction and Finish

How to Frame a Roof of Unequal Pitch

By RICHARD M. VAN GAASBEEK

School of Science and Technology, Pratt Institute, Brooklyn, N. Y.

CONTINUING the problem from our June issue, we will now proceed to lay out the jack rafters on the short common side. The length of the jack rafters Nos. 1, 2, 3, 4 and 5 are determined in the same manner as the preceding common rafter No. 6, for they are a part of the length of it. Take the runs from the layout, figure 1, measuring from the facia line to the center of the hip rafter. The five rafters are shown developed on the side of a single rafter, figure 8.

In practice these would be laid out separately and are laid out over one another on the drawings, only to save space and to avoid repetition.

Press the fence firmly against the top edge of the stock to be used, using the same figures on the square as for the previous rafter and produce the facia line or first plumb line to the extreme left, A, figure 8. Slide the fence to the right and measure on a level line from facia line A, the run of rafter No. 1, 1 7/16 inches, the run of rafter No. 2, 2 7/8 inches, the run of rafter No. 3, 4 5/16 inches, the run of rafter No. 4, 5 3/4 inches and the run of rafter No. 5, 7 3/16 inches, and produce plumb line C, figure 8, the extreme length of the rafter to the center line of the hip rafter.

From this length deduct one-half the thickness of the hip, measured on the line of the jack rafter, one-half the diagonal thickness of the hip, C-D, figure 9, which is an enlarged section through U-U, figure 1, and produce plumb line D. Square this line across the top edge of the rafter and locate the center as shown in the figure.

To simplify picking up the bevel for the top cut, draw in a section of the hip and jack rafter, full size on the layout, (figure 1 shown in May issue) as shown in the section, figure 9. Where the outside edge of the jack rafter intersects the outside edge of the hip rafter, square a line across at right angles to the center line until it intersects the center line as at I, figure 8.

To lay out the top cut so that the jack rafters will fit against the side of the hip rafter at the proper angle, measure back on a level line from plumb line D, on the side of the rafter, figure 8, the distance D-1, figure 9, and produce plumb line 1, figure 8. Connect plumb line 1 through plumb line D on the center line as shown at 2, top view, figure 8. The lower end of the rafter is, of course, an exact duplicate of the short common rafter.

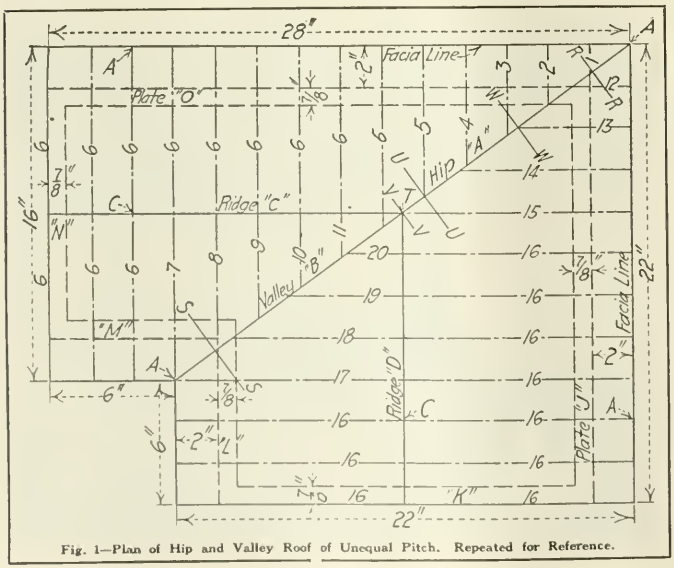


Fig. 1—Plan of Hip and Valley Roof of Unequal Pitch. Repeated for Reference.

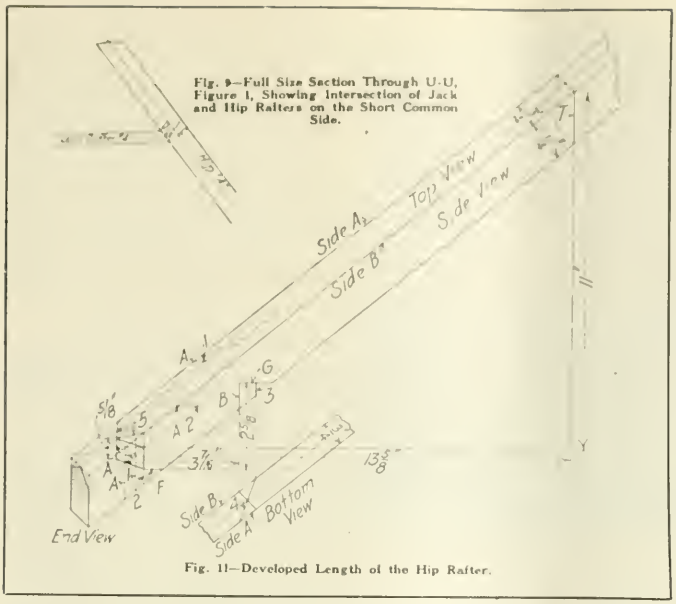


Fig. 11—Developed Length of the Hip Rafter.

Measure in from facia line A, measuring on a level line, 2 inches, the width of the projection, locating wall line B. Measure down on facia line A, from the top edge of the rafter, 5/8 inch, the width of the facia, locating plancher level F.

Measure up from plancher level F, measuring on a plumb line 2 5/8 inches, locating plate level G. Cut on line A, for the facia. On line F for the plancher level. On lines G and B for the birdsmouth. On bevel 2 on the top edge and plumb line 1 for the cheek cut against the hip rafter.

The length of jack rafters Nos. 7, 8, 9, 10 and 11 are determined in the same manner as the preceding jack and common rafters, with the exception that the top and bottom cuts are different. Take the runs from the layout, figure 1, May issue, measuring from the center of the ridge to the center of the valley rafter. The four rafters are shown developed on the side of a single rafter, figure 10.

In practice these would be laid out separately and are laid out over one another only to save space and to avoid repetition. Press the fence firmly against the top edge of the stock to be used and produce the first plumb line to the extreme left, C, figure 10. Slide the fence to the right and measure on a level line the run of rafter No. 7, 8 inches, the run of rafter No. 8, 6½ inches, the run of rafter No. 9, 5 1/16 inches, the run of rafter No. 10, 3 5/8 inches and the run of rafter No. 11, 2 3/16 inches, and produce plumb line C, figure 10, the extreme length of the jack rafters to the center line of the ridge. From this length deduct one-half the thickness of the ridge, 3/16 inch and produce plumb line B, the cutting length of rafter against ridge.

The bottom of all five rafters are beveled to make a fit against the side of the valley and jack rafters No. 7 and 8 also have a bearing on the plate so that the plancher level and birdsmouth must be laid out as for the common rafter on rafter No. 7 and the birdsmouth only for rafter No. 8.

To lay out the birdsmouth for rafters No. 7 and 8, measure in from plumb line A, figure 10, measuring on a level line, 2 inches, the width of the projection, locating wall line B. Measure down on plumb line A, from the top edge of the rafter 5/8 inch, the width of the facia, locating the plancher level F. Measure up from plancher level F, 2 5/8 inches, measuring on a plumb line, locating plate level G. Plumb line A represents the extreme length of the jack rafters to the center line of the valley rafter, so that from this length deduct one-half the thickness of the valley, measured on the line of the jack rafters or one-half the diagonal thickness of the valley, C-D, figure 9, which is an enlarged section through U-U, figure 1, and produce plumb line D, figure 10. Square this line across the top edge and locate the center. The bottom cut for these rafters is the same as for the preceding jack rafters, as all rafters on the

(*Continued on page 66*)

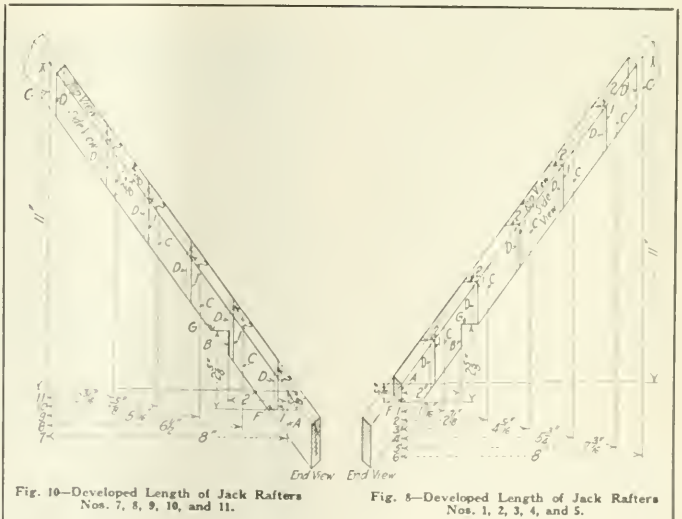


Fig. 10—Developed Length of Jack Rafters Nos. 7, 8, 9, 10, and 11.

Fig. 8—Developed Length of Jack Rafters Nos. 1, 2, 3, 4, and 5.



Screening the Living Porch

A Profitable Line of Work for Builders

FLIES and mosquitoes are the two pests that it is most desirable to keep out of the house and now-a-days when our porches are really outdoor living rooms, it is also necessary that they be screened.

There are two forms of porches in common use. One with the solid rail and the other the open rail. The one is termed a closed porch and the other an open porch. In making frames for a closed porch, it is only necessary for the screens to fit the opening. Now, the common method of doing this is to make it in sections that are easily handled. Sometimes, however, a pleasing treatment can be given to the screens themselves by having them of different widths. For instance, take an 8-foot space, it would look good to have this divided with a 4-foot screen section in the center and two 2-foot sections on either side.

To enhance the appearance, certain sections or the whole screen can be divided in small sections by muntins, the same as a sash is divided. There is really no reason why a screen should be in one or two divisions except that it is habit. A better architectural effect can be secured by dividing as we have mentioned.

For open porches, particular care should be taken so as to have the division bars at the same height of the top rail; frequently this is not done and the result is that it has an awkward looking appearance, and this can be so easily avoided.

In some cases the screens are put on the outside of the porch column and rail. This, however, does not give a pleasing appearance, as there is no finish to the top of the screen. Another method is to put them inside, and this seems to give the best results. Where there is no rail, screens are frequently put in a line with the center of the columns and the screen frames at the side cut to fit the form of the column. This method is a little harder to do than just the plain screen frame, but it produces a good effect, both inside as well as out.

Enough thought has not been given to the subject of designs for screens on porches and this is the reason we see so many ugly contrivances to keep out our flying and biting pests.

Screens can be conveniently hung on the special hardware that is now obtainable for the purpose. Should it be necessary, however, to have the frames screwed in place, it is always a wise precaution to grease the screws before inserting, as it makes withdrawal easier in the Fall. The use of brass screws would eliminate trouble of this sort.

The two porches shown on this page are good examples of how they can be conveniently furnished. The usual furniture is wicker work, which, together with grass rugs, some potted plants, hanging lanterns, bright colored cretonne cushions, etc., produce a charming effect at small expense.



What the Editor Thinks

New Code for Smaller Buildings

WE have been favored with an advance copy of the tentative draft of the proposed national building code for small houses that will be recommended by the Building Code Committee, Division of Building and Housing, United States Department of Commerce.

The committee has certainly done its work well. Thoroughness is reflected in practically every paragraph that they have prepared. Particular attention has been paid to describing construction details that will prevent the spread of fire; much space has been devoted to this subject, but no space is devoted to such other factors that are as equally important for the comfort of the inhabitants of our houses.

Of course, it is generally up to the architect or the builder to see that the house is properly designed, but would it not be a good idea to give some specific minimum requirements for space on stairways, etc.? Unfortunately there are many houses with too scant headroom at the stairway and one has to bend or dodge or bump one's head, usually the latter!

For every person that suffers from a fire in a dwelling, there are at least several thousand that suffer from wrongly planned details. Would it not be an excellent plan to combine some definite limits of construction sizes, etc., in the code? Of course, this is only a suggestion.

There are many such details that need attention that mean so much for the comfort and health of the occupants that it seems to us that these are also important points that should receive consideration in a code as well as protection from fire.

Practically all codes specify that water closet compartments should be adequately ventilated, but what code specifies that kitchens should be ventilated and lighted?

When builders can do what they want, irrespective of restraint, we can expect the building monstrosities that we have had to put up with for so many years.

Progressive builders know the value of proper restriction in a building code and live up to them, but it is the Bolsheviki element in the industry that needs restraint. Putting in the law what they should do is a good way of educating them to better construction methods.

Brick and Concrete Supplanting Stone

BUILDING stone is being used less than formerly in construction, according to figures just published by United States Geological Survey.

It was not so many years ago that practically all sills and lintels of our masonry buildings were of cut stone; today this has largely given away to brick and cast concrete.

The cement and brick manufacturers have been persistent advertisers in the construction papers, while it is but seldom that one sees anything regarding building stone.

Now, stone has its uses and is very desirable in its proper place; it adds an ornamental touch to some forms of construction and it is unfortunate that the stone industry has been so backward in making its product known and obtainable.

Mis-Information About Building

MANY articles are appearing in our newspapers and popular magazines regarding the building of homes and it is an unfortunate fact that a good deal of erroneous information is being spread about.

In some cases we read that concrete houses are damp and in some others that brick is a poor material to be used and others that frame buildings should be avoided; other cases that wood shingles make a fire trap of a building; that no building is fit to live in unless it is absolutely fireproof. Some writers state that we should build a house with large rooms, others to have them small and compact, etc., etc.

It is no wonder then that the ordinary individual who desires to build a house has rather a confused and hazy idea of just what he should have.

The best way for the builder to handle a client of this sort is to be able to give him all the desired information regarding different building materials and house arrangements. This information can be readily secured by builders from the literature of the different manufacturers and associations.

The builder should have on hand a good reference library of information of this sort. He will find it of considerable value when talking to a prospective home builder as he will be able to give correct and reliable information regarding any point inquired about.

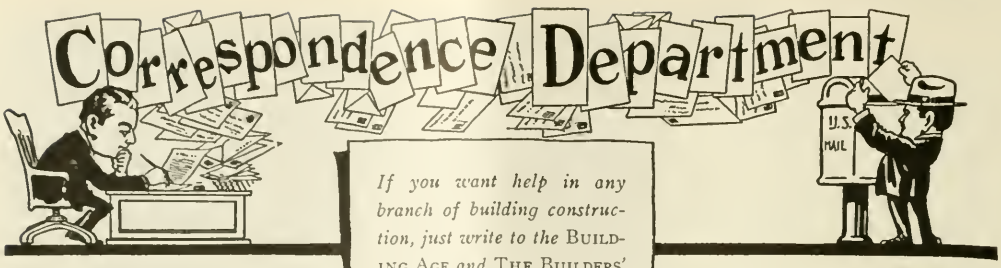
Home Improvements Paid by Installments

MANY people have purchased pianos, phonographs, clothes, houses, etc., by the partial payment plan. It is a scheme that fits into our modern living conditions. Why cannot builders go one step further in this regard by selling home improvements by the same method of payment?

There is many a family who have a good house, but some modern improvement is lacking. To make this alteration or repair costs quite a good sum of money and is beyond the owner at the present. For instance, if a man desires a porch enclosed to make a sun parlor, the total cost will probably run say to $300 or $400, but not having the money on hand, he hesitates to order it. He is without a desirable improvement and some builders and carpenters are out of a paying job because the scheme cannot be financed.

Here is something to discuss at the meeting of your Builders' Exchange. There are a lot of good jobs to be created if some scheme to finance them is provided.

Many lines of business have been developed to quite a large extent by the installment plan of payment and there is no reason why the same method cannot be used by builders to secure some very desirable business.



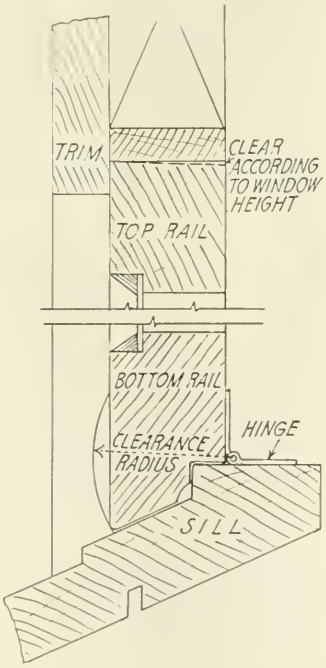
If you want help in any branch of building construction, just write to the BUILDING AGE *and* THE BUILDERS' JOURNAL *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Improved Stormtight Cellar Sash

SOME time ago I read a question in BUILDING AGE & THE BUILDERS' JOURNAL in reference to cellar windows being hung or hinged at the bottom, and how to make them stormtight.

I send you herewith the sectional drawing showing in detail how this can be accomplished and it has the advantage of being very easily made.



The arrangement of the bottom rail is the secret of its efficiency. Any water that might work up by capillary action would drop off at the quarter circle space. The other details are self-explanatory.—**J. S. Adrianzen.**

Stone and Concrete Difficult to Flash

WIDE copings or other places are occasionally encountered where a metal covering or a flash is required and no material is found wide enough.

This necessitates the material being used lengthwise and a provision must be made for securing the side seams. This may be done by drilling or making wedge holes with a chisel where needed. These holes may be run full of liquid solder, to which cleats may be soldered for holding the sheet material.

The sides or rather end of the flash, may be fastened by drilling holes with a slight downward slant into which wood plugs are made to wedge.

Several notches may be cut into the back end of these wood plugs; run a little hot lead into the holes and drive the plug into it immediately, then it will be ready to receive the nail which can be driven through the metal flashing into the plug to hold it secure.

For flashing fire walls of concrete, and the front of same, when sheet metal roofing is used, holes may be drilled in the concrete, and treated as already described, for the purpose of nailing wooden strips over the formed up edge of the top flashing metal. The plugs need not be so numerous when the top edge is coated with the following mixture:

To Oxide of Iron, add and thoroughly mix coal tar until it is a comparatively dry mass, then add boiled linseed oil until it is of the consistency of glaziers putty. This mixture will never dry hard and will carry a film on the outside that is impervious to water.—**L. S. Bonbrake.**

Ladder Scaffolds for Roof Work

A VERY simple workable scaffold for repairing pitched roofs up to a slope of 50 degrees can be made by taking or making a ladder of 2" x 3" with 2" or 3" x 1" rungs spaced 10 inches apart and nailing two 1" x 4" cleats across the back edges as seen in the attached sketch. Three temporary wire nails are driven through these cleats into the shingles, tar

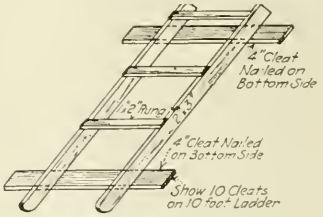


Fig. 1

paper or any other penetratable material with which the roofs may be covered. If there is a gutter projecting above the roof surface, the foot or bottom end of the ladder may be set in its trough to prevent its slipping down but the cleats are a safer method and safety ought to be the first consideration always.

Pieces of bagging or old carpet should be tied around the bottom ends of the

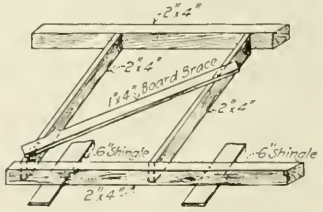


Fig. 2

ladder's side to avoid cutting of gutter troughs or be rounded as shown in Fig. 1.

When moving along or across any roof the nails are pulled out with a claw hammer and the holes plugged up, then the ladder is easily pushed or turned over as needed.

In rubber or other special roof coverings, the holes are filled with roofing cement or when putting shingles on a new house or relaying, reshingling or reroofing an old house, many good mechanics shingle in their scaffolds which is simply done by nailing the butt ends of strong wide shingles about the second or third course up from the bottom end above the gutter, spacing them about 4 feet apart, as shown in Fig 2. These may be used 4 or 6 feet between each or as far as a man can reach when shingling and are strong enough to safely carry two men and three bundles of shingles of 250 each, the butts of the shingles project below the level line of each course on which they occur; the 2 or 3 inches of the thickness of the 2 x 4 joists which form the footholds or scaffolds and these are sawed off to the butt course as the roof is being cleaned on completion of the job.

Sometimes if there be short pieces of joists or timbers available struts or uprights are employed spaced 4 feet apart and about 4 feet in length in the way also indicated in this figure and braced diagonally by reversed board braces to prevent sliding or side movement. It doesn't pay, however, to saw long joists or studding especially for this purpose although the pieces can be afterwards utilized for bridging or bracing in partitions.

Finally all scaffold and foothold joists and planks must or ought to be of good, sound, straight grained spruce timber free from large knots, cross or short grained.

It is a mistake and one is taking a risk in using Hemlock for scaffolding of any kind whatsoever either for uprights or horizontal pieces, so let us protect ourselves while at work by working safely.—**Owen B. Maginnis.**

California Chalet

BUILDING AGE & THE BUILDERS' JOURNAL fills the bill all right. Although I am a long distance from New York, each issue is eagerly looked for, as it contains some useful information that I can use in my daily work.

In some of our reclamation work out here, I have occasion to design a good many houses and I am sending you a little sketch of a bungalow after the Swiss Chalet Style. The floor plan is a very convenient layout. The exterior walls were built of concrete block. A large reinforced lintel is used over the front porch opening. The rear porch was framed above with a wood gable.

I feel sure this will interest some of your readers.—**Frank Johnston.**

HAVE you ever used any machinery or device which has saved you time and money?

Have you ever invented any way of doing a piece of work quicker?

If you have BUILDING AGE and BUILDERS' JOURNAL wants your experience, and will pay regular space rate for it.

Your description should tell just how you saved time and money, either by a special way of using machinery or by short cuts in construction. Point out what methods you were using before adopting your "Time Saver" and show how your new method turns the trick. You can submit as many articles as you want.

Address The Editor, BUILDING AGE and BUILDERS' JOURNAL 920 Broadway, New York City.

Leveling Without a Level

IT often happens that leveling is to be done, when there is no transit or spirit level obtainable. In this case, good and fairly accurate work can be done with a makeshift apparatus consisting of a vessel of water and an improvised float.

Secure a small slab of wood eight inches in length and three or four inches wide that is free from knots and as nearly uniform in weight as possible and erect two thin wood sticks, mast fashion, one at each end, and in the same relative position. Into one stick screw a small screw eye so that the opening faces the other stick and into the top of this drive a small pin or needle.

This is then made accurate by driving the pin down until the distance from the bottom of the block to the top of the pin is the same as the distance from the bottom of the block to the center of the opening in the head of the screw eye.

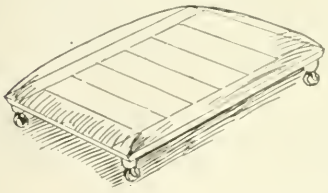
The leveling process is then carried out by sighting over the head of the pin through the center of the screw eye to the point in question.

This crude device will readily show relative points over uneven ground, and it may even be used for leveling foundations, etc., and will save the expense of hiring an engineer in a number of cases.—**Dale R. Van Horn.**



Floor Work Knee Rest

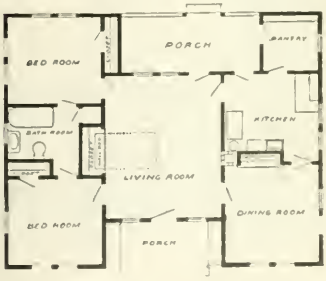
THE drawings presented herewith illustrate a valuable knee rest that saves the knees, clothes and time and permits work in comfort.



It facilitates a workman moving about without rising while engaged in various floor work, such as scrubbing, oiling, parquet laying, etc.

It is simply constructed of light wooden boards, padded and mounted on four small rubber-tired casters.—**C. Nyc.**

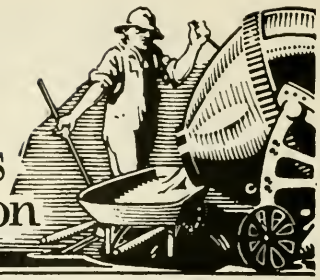




Floor Plan

CONCRETE

Form Work-Reinforcing Methods Monolithic and Block Construction



Casting a Well Curb

By LAWRENCE S. KEIR

THE carpenter contractor, especially in rural districts, is often called upon to do small mason jobs; covers for well, cesspools, etc., being one of the numerous things he is called upon to make. The accompanying drawings show an easy method of casting a concrete cover for a well. Such a cover can be used for many purposes and made of a shape and size to suit conditions.

The stone is cast on the ground or on a bed of sand. In either case, a space a little larger than the proposed stone and as near as possible to where the stone is to be made use of, is leveled off and packed solid and smooth and then covered with a layer of heavy paper, and cast on this.

The outside form is of short pieces of 2″ x 4″, cut square at one end. The pieces are set on edge and held together at each corner by two 10-penny wire nails driven through the side of one piece into the squared end of another. Any surplus length of 2″ x 4″ is allowed to run by and these projecting ends add to the ease of knocking form apart again after the stone has set. After the form is nailed together it is set square and level in its place and held there by earth or sand packed against the outside.

The manhole form shown is easily made and if kept clean will last a long while. It is made of fairly heavy sheet metal but of a gauge that can be easily cut with the tin snips.

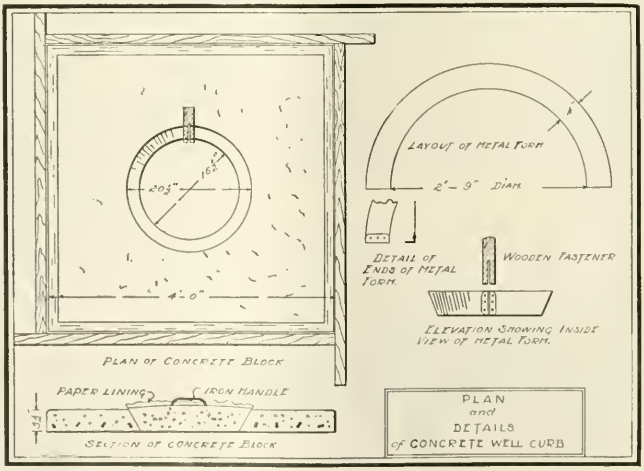
First cut out a half circle as shown in the layout drawing. Then at each end of the half circle rivet on a piece of the same kind of material that has been cut and bent to form an angle as shown by the small detail below.

Having the angle piece in place, spring the curved piece carefully and evenly until it forms an even ring with the angle pieces on the inside. A piece of wood having a wide saw kerf at one end, is slid down over the projecting wings of the angle pieces and holds the mould in shape.

In casting the stone set the metal mould where required. Fill in the body of the block and as soon as the concrete has set enough to hold its shape, remove the metal form by slipping the wooden fastener off. Then the edges of the manhole thus formed are lined with strips of building paper cut wide enough to extend a little way above the top of the stone. Now pour in the concrete that is to form the cover, leveling it off at a point about 1/8″ above the rest of the block. The handle is then set.

When the concrete has set hard the cover can be lifted out, the paper removed and the cover will fit back neatly in its place. A corresponding arrow mark put on cover and main block while the concrete is soft, will assist in finding where the block fits best.

Four lengths of two-strand fence wire placed parallel with each other on all sides of the block and lapping over at the corners does very nicely for reinforcing but anything available at the time can be used instead. The reinforcing is of course placed well near slab bottom.





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Legal Department

IN a suit to recover damages for injury to a carpenter claimed to have been due to negligence of the defendant, by whom he was employed to remodel a grain elevator, the Michigan Supreme Court lately said (Norris v. Elmdale Elevator Company, 185 Northwestern Reporter, 696):

Measuring Value of Loss of Carpenter's Earning Power

"A question is raised respecting damages for impairment of earning capacity. Plaintiff's damages in this regard should be measured by his impairment of earning capacity of his usual employment. . . . As bearing upon that question, evidence might be received of subsequent earnings in the same or other employment, and of changes in wages and conditions of labor. . . . The rule is stated in 17 C. J. 898:

"'The difference in the actual earnings of plaintiff before and after the injury does not constitute the measure; hence the amount which plaintiff is capable of earning, and not that which he has actually earned, since the injury is to be taken for the purpose of comparison with his previous earnings as showing the diminution of earning capacity.'"

A NEW JERSEY builder, but not licensed architect, asks concerning his right to recover compensation under the following stated circumstances:

Builder's Right To Recover for Plans Used

He verbally agreed with a lot owner to draw plans for a building to cost between $17,000 and $18,000, and consisting of two stores and six rooms on the first floor and four rooms and five rooms on the second floor.

When these plans were completed, he directed that the builder change them so as to provide for two four-room apartments on the second floor. After this change was made, he directed a further change to provide a janitor's apartment in the basement. Then he had this apartment cut out.

On these changes being made, the builder was directed to make the blue prints and file them. The builder agreed that no charge would be made for the plans should he refuse to build the structure for the estimated amount.

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age and The Builders' Journal, 920 Broadway, New York City.

The day after the plans were filed with the city the owner sold the lot, and now declines to pay the builder for his plans, stating that since he did not build he was not liable for the plans.

On the facts we are of the opinion that the builder has a valid claim for the reasonable value of his services in preparing and filing the plans, etc.

That he was not a certified architect makes no difference, for while the New Jersey statutes in general forbid unlicensed persons to engage in the business of preparing plans, etc., it is distinctly provided that the act shall not be construed to prohibit any person from acting as designer of any building to be constructed by himself or his employees.

Of course, if it had been provided that the builder's rights to compensation were to be contingent on the owner actually proceeding with construction of the building, there would have been no right to compensation. But under the circumstances stated, we do not believe that the builder would have difficulty in establishing in court his right to reasonable pay for services.

In the case of Graves vs. Hunt, 8 New York State Reports 308, it was decided that where the owner refused to permit a builder to carry out a contract for the construction of a building, the value of the builder's services in drawing the plans was a recoverable element of damage.

I BUILT a house and the owner was to get the money from the Building Association and make four payments on the job, but failed to do so. I finished the job without delay and there was $84 worth of extras, for which I was holding written orders The lawyer, owner and association asked me to sign a release of liens, so that the owner could get the money to pay me, but the association would not pay the $84 for extras. The owner and attorney then promised that if I would sign the release of liens they would guarantee payment of the balance within two weeks. At the end of two weeks I received a check for $46 and a note saying that they would not pay any more as I had signed a release of liens, and he [the owner?] considered this a receipt in full, and that it was all he intended to pay for extra work. What are my rights?—G.L.F., Pa.

Effect of Release of Liens

Answer—For the benefit of G.L.F. and other readers of THE BUILDING AGE, we make this suggestion before proceeding to answer this query: When a builder or architect is willing to forego his right to a lien for work or services furnished, on the strength of a personal guaranty of payment, the guaranty should be reduced to writing. Proper procedure in the case above mentioned would have been for the release of liens to have expressly recited on its face that, in consideration of Bill Lawyer and John Owner personally guaranteeing payment of $84 covering extras, any right to a lien on that account was waived. At the same time Bill Lawyer and John Owner should have signed some such writing as this: "In consideration of G.L.F.—— foregoing right to lien for $84 extra work performed in building the undersigned John Owner's house, we personally guarantee payment to G.L.F.—— of that amount on or before ——, 1921."

But, even as matters now stand, nothing appears to relieve the owner from liability from any balance actually due under the contract for extras. It is absurd to say that a mere release of



Residence in Country Club District, Kansas City, Mo. Redwood Siding, painted white. Built by the J. C. Nichols Investment Co. Edward W. Tanner, Architect.

Residence and Garage at Belmont, Mass. Redwood Siding, painted white. Built by George Almgren. George Reid, Architect.

Residence at Des Moines, Iowa. Redwood 6-inch Colonial Siding, painted white

Residence at Highland Park, Ill. Redwood Special Sawn Shingles, painted white. Robert Seifarth, Architect.

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Use these selling points and you will find that using Redwood you can get better prices.

Redwood should be specified for

Exterior Construction

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Natural, stained or painted wood block floors.

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Tanks and vats for water, chemicals and oil—factory roofs and gutters—wood block flooring.

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Such as—Caskets and burial boxes—incubators and ice-cream cabinets—cigar and candy boxes—furniture manufacturing, etc.

Railroad Uses

Such as—Railroad ties and tunnel timbers—signal wire conduits and water tank—car siding and roofing.

Farm and Dairy Uses

Such as—Silos, tanks and troughs—hog feeders and implement sheds—wood block floors, etc.

For the convenience of builders and architects we have prepared our "Construction Digest" and our "Engineering Digest." They will be sent free on request by either our New York or Chicago office. Write for them.

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liens releases the personal liability of the owner for any balance actually due. But, of course, it would be open to the owner to show that the builder is not entitled to more than the $46 already paid for extras. On the other hand, if there is a balance actually due, as the builder claims, there is no bar to his obtaining judgment for the amount. And it is probable that under the laws of Pennsylvania, the same as under the laws of many other states, the judgment can be recorded in such way as to constitute a lien against any real estate the owner may own subject to prior encumbrance including the building association's mortgage. The "release of liens" is probably so worded as to mean merely that the right to a mechanic's lien was waived. If so, this would not preclude creation of a judgment lien. But it may not be necessary to attempt to enforce judgment against the owner's real property. If he is a man of some means it may be that his bank account can be reached by garnishment. In any event, if he refuses to pay, much must be left to the builder's attorney employed to enforce the payment of the balance due.

Assuming that the attorney did not commit his guaranty of payment of the balance due for extras to writing, we do not believe that he can be held under the Pennsylvania statutes. There is a law in that state that promise to answer for another's debt in excess of $19.99 is not enforceable unless in writing.

When are Building Restrictions Violated?

I OWN a house and lot in a city. There is a convenant in my deed which says that no house shall be placed nearer than fifty feet from the front line of the lot. The main front wall of my house is just 50 feet from the front line of the lot, but I find that the eaves of the house extend a foot over the 50-foot line. Am I violating this restriction?

"If I am violating the restriction, can I collect the cost of moving the house back from the man who sold it to me, as the covenant is a part of the deed? If my house complies with the restriction, can I compel the other house owners on the block who are bound by the restriction to move their houses back to the 50-foot line? My next neighbor has built a house that extends 15 feet in front of mine and completely cuts off my view on that side."—H. H., South Carolina.

Under the facts stated, we do not believe that legal redress can be had against you as for violating the building restriction mentioned.

In the first place, it is very doubtful that you have violated the legal spirit of the restriction. It seems to fall within the liberal legal principles stated as follows in a comparatively recent and authoritative summary of the law of this particular angle of building restrictions:

"Conditions and restrictions regulating the distance at which buildings shall be placed from streets, or, as they are commonly known, building line restrictions, must be construed according to the fair meaning of their language. . . The purpose of a building line restriction is to prevent the encroachment of *substantial parts* of buildings erected upon property. Hence there are quite numerous authorities holding that such a restriction is not violated by an extension over the line of steps leading to the building [citing New Jersey and California cases], or by bay windows [citing Pennsylvania and Illinois cases], porches [citing Kentucky, Massachusetts, Ohio and Virginia cases], or awnings [citing New York case]. An encroachment of an integral part of the building is, however, a violation. This rule has like the preceding one, been applied to bay windows and porches." 18 Corpus Juris, 389.

We infer from the statement of the case that the projecting eaves will not interfere with the light, air and vision of the occupants of the adjacent houses. If this is true, the case falls within the statement of the Illinois Supreme Court:

"The two objects of a building line restriction are to secure unobstructed light, air and vision for the lots for whose benefit the restriction is created, and to secure uniformity in the location of buildings with respect to the street line for the accomplishment of that object." (Loomis v. Collins, 272 Ill. 221, 230, 111 N. E. 999).

That the law regards substance, rather than technicality in enforcing building line restrictions is shown by the following summary of numerous decisions:

"While it has been held that a breach of a restrictive covenant may be enjoined regardless of the fact that complainant has suffered no substantial injury, the more general rule, particularly in the case of restrictions imposed by a general building plan, is that equity will not take cognizance of technical or immaterial violations. A person relying upon the defense, however, that complainant will not suffer any substantial injury through his violation of a restriction must clearly establish such fact." 18 Corpus Juris, 399.

The first qestion raised by the gentleman from South Carolina appears to be squarely answered by the decision in the New Jersey chancery case of Smith v. Spencer, 87 Atlantic Reporter, 158, wherein it was decided that an overhanging of eaves by two feet, two inches, did not constitute a substantial violation of a building line restriction. And in the case of Morrow v. Hasselman, 69 N. J. Eq. 612, 61 Atl. 369, it was decided that round towers, bays, or projections, and piazzas with slender columns on the second story of a house, a few feet beyond the building line, were immaterial deviations.

But even if it could be said that the overhanging of the eaves in this case constitute a substantial violation of the building restriction, it appears that others owning property in the block have previously violated the same restriction. This being so, our friend would probably have no trouble in establishing a claim that all parties interested in the enforcement of the restriction have virtually waived their respective rights to enforce it. Certainly those who have violated it are in no position to seek legal relief in this case. Nor can those who have permitted the building to be erected with knowledge that the eaves would overhang now seek relief in the courts. It has been frequently declared that objection to violation of a building restriction must be promptly asserted.

Were it to apear that the building restriction has been violated in this case and that one or more interested persons are in a position to bring suit to require the building to be moved back—which, for the reasons already stated, we do not believe to be true—it is likely that the gentleman from South Carolina could enforce a valid claim for damages against the person from whom he bought, covering the expense of so moving the house. But to do this it would probably be necessary to prove that the seller of the house built the house or knew when he sold it that the building restriction had been violated.

Right to proceed against the other owners of property in the block is covered by what has been said above concerning this property. There is no right to proceed against them if their violations are trivial or have been waived by failure earlier to proceed against them. Our friend is not in a favorable position to insist on adjacent buildings being moved back, since he bought with knowledge of their location. However, he would be justified in filing counter-suits against any one who may attempt to require him to move his building back, and who is open to a similar suit.

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I Buy Varnish from .....

"Made to Walk on"

Johnson's Floor Varnish dries dust-free in two hours and hard over night. It imparts a beautiful, high lustre—has good body—will give long wear—is absolutely water-proof—and will stand all reasonable tests.

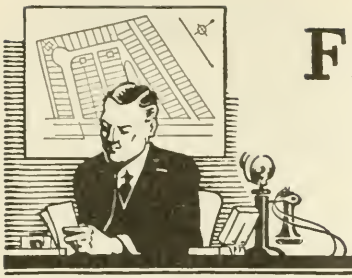
Johnson's Floor Varnish is tough, elastic and durable. It gives a beautiful high gloss which will not chip, check, mar, blister or scratch white. Is very pale in color so can be used on the lightest floors and linoleum. Splendid for furniture, woodwork and trim of all kinds. May be rubbed if desired.

Free to Contractors

We will gladly send you a pint of Johnson's Floor Varnish, all charges prepaid, if you will test it in comparison with the brand you are at present using. Write us on your business letterhead—there is no obligation whatever attached to this offer.



JOHNSON'S FLOOR VARNISH



FINANCE and REAL ESTATE

Helpful Data for the Builder Who Builds to Sell

Interesting Home Financing Plan

MANY of the problems of the prospective home owner of moderate means arise mainly from the fact that he is generally ignorant of the ways in which the purchase may be financed. Many methods of financing a home proposition have been devised and these are all of interest to the building contractor, as financing building operations gives work to the different members of the building industry. Any sound method of financing that will tend to promote building of homes will receive the endorsement of the building fraternity.

An interesting home financing method has been devised by the United Home Owners of America, a Washington, D. C., corporation that operates on co-operative lines. It is not a stock company or a mortgage company, nor is it a building and loan association. It is an organization operating under an agreement and declaration of trust. Its purpose is to provide a practical way for people of moderate means to own homes of their own. Their method of operating is by forming a Pool. In other words, a group of intending home builders Pool their savings for the benefit of all. Thus, for instance, say 500 individuals are each saving $50 per month. This sum of money is paid into the holding company and this money is given out in loans on real estate. All loans are made in order of priority determined by the date of application. Thus, for instance, assuming that the 500 individuals are paying in at the rate of $50 per month, there is available for distribution $25,000 per month. In other words, approximately five loans of $5,000 can be made each month. In this way a man that has the first contract will receive his loan if he desires it quite rapidly. Of course one has to wait until his turn comes for his loan.

In cases where a loan is not desired at the time when the party's turn comes up, he may sell the loan to a person who is anxious to secure his immediately at perhaps a little premium and transfer his number to the other party who purchased his privilege from him.

By this co-operative method, the loans are made at an interest rate of 4% per annum, the legal interest rate in most states being 6%. Figuring on a basis of $1,000 loan the interest at 4% for a period of ten years would amount to $210.41. It has been figured out that the loan will repay itself in 10 years, therefore the total amount paid is $1210.41. Under the building loan plan, a loan is paid in 11 years at 6% interest per annum, amounting to a total of $1,660; therefore, this method results in a saving of $449.00 on every $1,000 borrowed.

There are about 9,000 building and loan associations in America. Five million people are interested in them and they involve over $2,000,000,000. Next to life insurance the Building and Loan Associations have been the greatest economic factors and most beneficial institutions ever devised for the human race. But, after 140 years of operation, they are, nevertheless, far insufficient in number, since the housing problem is as serious as ever.

Anyone desiring to take advantage of the plan to secure a loan with which to buy or build a home makes application on the regular form, the actual date and time determines the exact order in which he will be entitled to secure a loan in the series to which his contract belongs. With the application he begins making monthly payments of 1 per cent of the amount he desires to borrow. Upon receipt and acceptance of the application a contract is entered into.

Contracts are placed in series aggregating substantially $500,000 face value each and each series operates independently. The contract holders themselves create their own loan funds. As soon as the accumulation in the loan fund, from its monthly contributors, monthly repayments of principal and interest on loans and other sources of income has reached the amount desired by the borrower, he is so notified and is entitled to receive a loan equal to the amount of the face value of his contract. All loans are secured by mortgage on real estate and are repaid at the rate of $7 a month per each $1,000 advanced with interest at 4% on the yearly unpaid balance. As each year goes by, the payments become less and less, and in approximately 10 years' time the home is free and clear of debt.

Apparently realizing the urgent needs caused by the shortage of homes, the states of Missouri and Texas have endorsed and encouraged the plan by passing an act specifically authorizing similar organizations. Quite recently, the Supreme Court of a western state confirmed the validity and constitutionality of the act.

In common with all financial institutions located in District of Columbia, the United Home Owners come under the supervisory control and examination of the Comptroller of the Currency and is examined and submits reports regularly.

YOUR sheet metal problems

become our problems—in fact, the interest of our organization in the permanent success of your product, wherever Steel Sheets and Tin Plates are involved, is second only to your own. It will pay you to tie to the experience and service we offer—they will prove a valuable asset to you in your business.

KEYSTONE COPPER STEEL

Soft and ductile of itself, copper is the martial music that adds the grit of fight wherever rust threatens. It is steel's most effective ammunition. Use it for longer wear and greater permanence.



Use Apollo-Keystone Galvanized. Shall we send new Weight Cards and Apollo Calendar?

For roofing, siding, gutters, spouting, eaves trough, sheet metal and tin work, use Keystone quality Galvanized Sheets and Roofing Tin Plates. Time and weather prove it best for both builder and owner. Sold by leading metal merchants. Look for the added Keystone.



Write for booklets describing Keystone Copper Steel Sheets, Formed Products, and Terne Plates.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

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Chicago Cincinnati Denver Detroit New Orleans New York Philadelphia Pittsburgh St. Louis

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Pacific Coast Representatives: United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle

Review of the Building Situation

BUILDING statistics for May just published by F. W. Dodge & Co. show that the volume of contracts awarded are the highest ever recorded, being 3 per cent. greater than that of April, 1922, which previous to this, held the record. The May figures total $362,590,400 which is 50 per cent. greater than the figures for the corre ponding month of last year. The two record months of April and May bring the volume of construction started since Jan. 1st, up to the immense sum of $1,352,965,000, the highest record figured for the five months of any year. These figures are 61 per cent. greater than that of the corresponding period of 1921.

A very noticeable increase in building has taken place in the middle west district, which has heretofore been very much behind its normal amount of building.

Residential building still heads the list in construction activities, the amount expended for this form of construction being $140,932,500, which is 39 per cent. of the entire total amount. In the North Atlantic states, the immense sum of $76,872,600 is being spent for residence construction. This represents the construction of 6,914 separate buildings, therefore the average cost of the buildings being erected today is a little over $11,000 each.

Another important item in the May total is expenditure of $67,515,000 or 16 per cent. of the entire total for business buildings. This is an increase over last month's figures and is a very good barometer of the upward trend of business.

May building contracts in New England amounted to $33,130,000, which is 76 per cent over the figure for May, 1921, although it was a drop of 25 per cent from the April total, the high figure record for this district.

Construction started in New England during the first five months of this year has amounted to $137,063,000, which is more than double the amount for the corresponding period of last year.

Contracts awarded during May in New York State and northern New Jersey amounted to $88,295,000. This is 13 per cent under the April figure, which established a new high record for the district. The decline was entirely in New York city, the remainder of the district showing a May total equal to that of the previous month. The May total, however, was 53 per cent higher than that for May, 1921.

May building contracts in the Middle Atlantic States (eastern Pennsylvania, southern New Jersey, Delaware, Maryland, District of Columbia, Virginia and the Carolinas) amounted to $54,652,000, an increase of 12 per cent over the previous month and of 25 per cent over May, 1921.

Record of May, 1922. Building Contracts Awarded

Classification of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$4,842,600	$15,503,700	$8,247,300	$19,145,100	$9,352,900	$423,600	$57,515,200
Educational	4,124,700	7,420,300	2,764,300	6,897,900	9,740,200	1,977,800	32,925,200
Hospitals and Institutions	859,200	2,478,200	1,514,900	1,711,800	1,737,500	135,000	8,436,600
Industrial	2,361,800	3,530,700	4,649,700	3,848,500	9,257,700	244,600	23,893,000
Military and Naval	100,000	37,700	22,100	15,000	.....	163,000	337,800
Public Buildings	79,700	417,800	527,600	1,192,000	250,600	38,700	2,506,400
Public Works and Utilities	4,258,100	7,350,300	11,377,600	11,665,000	25,461,600	3,704,500	63,817,100
Religious and Memorial	914,000	2,377,000	1,749,400	2,206,000	4,510,000	210,000	11,966,400
Residential	14,638,300	39,804,400	22,433,900	22,396,700	37,795,300	3,863,900	140,932,500
Social and Recreational	951,300	9,375,000	1,365,400	2,989,000	5,427,500	152,000	20,260,200
Total	$33,129,700	$88,295,100	$54,652,200	$72,067,000	$103,533,300	$10,913,100	$362,590,400

Building Projects Contemplated May, 1922

Classification of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$4,750,100	$15,685,100	$6,881,600	$7,965,300	$21,510,400	$908,200	$57,700,700
Educational	6,083,500	8,277,500	4,018,500	5,478,500	9,562,600	1,013,000	34,433,600
Hospitals and Institutions	1,613,000	3,485,000	1,101,000	1,625,800	7,254,000	165,000	15,243,800
Industrial	2,621,800	5,290,900	5,542,800	73,421,500	13,027,000	1,058,700	100,962,700
Military and Naval	.....	197,000	265,000	15,000	130,000	46,000	653,000
Public Buildings	109,700	885,500	269,000	154,000	947,400	302,500	2,668,100
Public Works and Utilities	2,331,100	10,773,700	12,687,200	20,036,400	39,346,200	6,529,100	91,603,700
Religious and Memorial	874,500	2,127,400	1,499,200	3,421,000	4,884,000	449,000	13,255,100
Residential	21,705,300	58,433,000	25,058,800	25,025,100	48,576,800	4,964,900	183,763,900
Social and Recreational	4,835,500	2,450,000	2,158,200	4,843,500	4,505,500	337,000	19,129,700
Total	$44,924,500	$107,605,100	$59,481,300	$141,986,100	$149,643,900	$15,773,400	$519,414,300


The
Home Beautiful
Is the
Home Profitable
A COMFORTABLE, attractive home invariably sells more homes and creates more business for architect, builder and dealer. That is why Natco "Tex-Tile" is a profitable investment for all three. The beautiful, comfortable and economical homes that have been built of Natco "Tex-Tile" are helping to build others today.
Natco "Tex-Tile," like all Natco Double Shell Tile, is easily and quickly laid. It is impervious to heat, cold and moisture. It is decidedly economical and brings a beautiful home within the reach of countless home building prospects.
Send us a card and ask for our circular: "The Home Beautiful," which shows Natco "Tex-Tile" in its beautiful, natural colors. It's free.
NATIONAL FIRE PROOFING COMPANY
1433 FULTON BUILDING
PITTSBURGH, PENNA.
NATCO TEX-TILE

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	May 29	June 27
LONG LEAF YELLOW PINE—		
B. and Better Edge Grain Flooring, 2¼" Face	$71.50	$80.50
Dimensions, S1S1E, No. 1 Common, 2x4", 10'.....	39.75	39.75
Timbers, Merchantable, '05, 12x12". 10 to 20'.....	51.50	53.00
B. and Better Ceiling, ½x3¼.....	44.00	45.50
B. and Better Partition, ¾"x3¼".....	55.00	59.00
B. and Better Finish, 1x3".....	63.00	63.00
No. 1 Common Boards, 1x8".....	42.00	47.75
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13/16x2½".....	$58.50	$64.00
Roofers, 13/16x5½".....	29.00	33.50
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3".....	$73.00	$75.00
No. 1 Clear V. G. Flooring, 1x4".....	71.00	77.00
No. 2 Clear and Better Ceiling, ⅝x4".....	45.00	45.00
No. 2 Clear and Better Novelty Siding, 1x6".....	52.75	52.75
No. 2 Clear and Better V. G. Stepping.....	86.00	89.00
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M	$7.40	$7.40
Washington Perfection Shingles, per M.....	7.18	7.18
Clear Bevel Siding, ½x6".....	43.50	43.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½".....	$8.25	$8.55
Dimension, 2x4", 10 to 16'.....	34.00	34.00
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2¼".....	$151.25	$151.25
Clear Plain White Oak, 13/16x2¼".....	110.00	110.00
Clear Plain Red Oak, 13/16x2¼".....	110.00	110.00
Clear Maple, 13/16x2¼".....	97.00	100.50
(All lumber prices furnished by National Lumber Merchant)		
COMMON BRICK—		
Per M, f. o. b. job.....	$24.00	$23.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered.....	$2.60	$2.60
STRUCTURAL STEEL (IRON AGE)—		
Per 100 lb. to large buyers.....	$1.98	$2.11
CRUSHED STONE (cu. yd.)—		
¾ in.	$3.00	$3.00
1½ in.	2.80	2.80
WALL BOARD—		
Per 1,000 sq. ft. in lots under 1,000 sq. ft.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.....	45.00	45.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered.....	$17.00	$18.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered.	19.00	20.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	22.00	22.00
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag.....	$0.60	$0.60
Masons, per 50 lb. bag.....	.45	.45
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.50	$1.50
¾ in. Gravel (per cubic yard).....	3.00	3.00
1½ in. Gravel (per cubic yard).....	3.00	3.00
FACE BRICK—		
Tapestry (delivered)	$45.00	$46.00
Caledonian (delivered)	40.00	41.50
Smooth Grey (delivered).....	50.00	54.50
Fisk Lock f. o. b. factory.....	32.50	36.00
SHINGLES—		
Asphalt, Single (per square).....	$7.00	$8.50
Asphalt, Strip (per square).....	5.25	6.75
STAINED WOOD SHINGLES—		
16 in. Extra Clear (per square, delivered).....	$11.25	$11.00
18 in. Eureka (per square, delivered).....	11.50	11.00
18 in. Perfection (per square, delivered).....	12.50	12.00
24 in. Royal (per square, delivered).....	12.25	12.25
24 in. Imperial (per square, delivered).....	13.00	12.50
VITRIFIED SEWER PIPE—		
4 in. (cents per foot).....	$0.10½	$0.10½
6 in. (cents per foot).....	.15¾	.15¾
SLATE ROOFING—		
Banger or Slatington, 8x16 in. (per sq. at quarry)...	$8.40	$8.40
CORNER BEADS (Galvanized)—		
Per Foot	$0.04	$0.02½
WALL TIES (Galvanized)—		
Per Thousand	$5.00	$5.00
FLUE LINING—		
8½ x 8½ in. Per Foot.....	$0.28	$0.27
8½ x 13 in., Per Foot.....	.40	.40
HOLLOW TILE—		
8 x 12 x 12 in., heavy. Each, delivered.....	$0.23½	$0.23½
HAIR—		
Per Bushel	$0.60	$0.60
PLASTER BOARD—		
32 x 36 x ⅜ in., Each.....	$0.24	$0.22
MAGNESITE STUCCO—		
Per Ton	$70.00	$70.00
TILE—		
1 in. Square or Hexagon, White, per sq. ft.....	$0.25	$0.25
3 x 6 in. White Wall.....	.60	.60
8 x 8 in. Red Floor.....	.45	.45

CHICAGO PRICES

	May 29	June 27
YELLOW PINE—		
Boards, 1x8, No. 1 Com.....	$39.00	$40.00
Casing and Base, 6-8 in.....	64.00	65.00
Ceiling, ⅝x4, B. and Btr.....	43.00	45.00
Dimension No. 1, 2x4, 12 to 14 ft.....	35.00	35.00
Drop Siding, 1x6, B. and Btr.....	46.50	49.75
Finish, 1x4, B. and Btr.....	61.00	63.00
Flooring, B. and Btr. E. G., 1x3.....	74.00	75.00
Lath, 4 ft., No. 1.....	6.75	7.00
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	40.00	44.00
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear.....	$94.75	$94.75
Oak Flooring, ⅜x2, Cl. Pl., White.....	75.00	72.00
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear.....	$39.25	$42.25
Finish, S2S or S4S, 1x6 to 8 in. clear.....	84.50	91.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear.....	$44.50	$43.00
Shingles, Extra Clears, 16 in.....	5.15	4.80
COMMON BRICK—		
Per M, f. o. b. job.....	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$1.97	$2.07
STRUCTURAL STEEL—		
Per 100 lbs. to large buyers.....	$1.98	$2.01
CRUSHED STONE (cu. yd.)—		
¾ in.	$2.00	$3.00
1½ in.	2.00	3.00
WALL BOARD—		
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	$45.00	$45.00
Per 1,000 sq. ft. in lots under M.....	50.00	50.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$2.00	$3.00
¾ in. Gravel (per cubic yard).....	2.00	3.00
1½ in. Gravel (per cubic yard).....	2.00	3.00

ST. LOUIS PRICES

YELLOW PINE—		
Boards, No. 1 Com., 1x4.....	$35.00	$37.00
Partition, ¾x3¼, B. and Btr.....	52.50	52.50
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	32.00	34.00
Finish, S2S, B. and Btr., 1x4, 6 & 8 ft.....	58.00	61.00
Flooring, B. and Btr., E. G., 1x3.....	72.00	76.00
Flooring, B. and Btr., F. G., 1x3.....	59.00	59.00
Lath, 4 ft., No. 1.....	6.10	6.63
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	39.00	41.00
CALIFORNIA REDWOOD—		
Finish, S2S, Cl., 1x6 in.....	$84.50	$91.50
Siding, 4 in. Bevel, 10 to 20 ft.....	40.00	42.25
8 inch Colonial	66.75	53.25
8 inch Bungalow.....	68.75	69.75
HARDWOODS—		
Oak Flooring, ⅜x1½ and 2 in., Clear Qtr. White.....	$112.50	$106.50
Maple Flooring, 13/16x2¼ in., Clear.....	96.75	91.00
RED CEDAR—		
Siding, ½x6, Clear	$41.00	$41.00
Shingles, Clears, Per M.....	5.06	4.96
COMMON BRICK—		
Per M., f. o. b. job.....	$16.00	$17.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.10	$2.10
STRUCTURAL STEEL—		
Per 100 pounds to large buyers.....	$2.07	$2.10
CRUSHED STONE (cu. yd.)		
¾ in.	$1.83	$1.83
1½ in.	1.83	1.83
WALL BOARD—		
Per 1,000 sq. ft. in lots under M.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	45.00	45.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.10	$1.10
¾ in. Gravel (per cubic yard).....	1.30	1.30
1½ in. Gravel (per cubic yard).....	1.25	1.25

$1,000 IN CASH PRIZES

for Best Photographs Showing

Durability of Copper, Brass and Bronze

$500 in Cash Prizes for
OBJECT LESSONS IN WASTEFULNESS

of using substitute metals where one of the non-rusting metals, Copper, Brass or Bronze, should be used.

First prize, $150 Second prize, $125
Third prize, $ 75 Fourth prize, $ 50
Ten prizes of each, $10

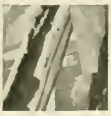
$500 in Cash Prizes for
OBJECT LESSONS IN ECONOMY

of using Copper, Brass and Bronze, which will not rust, and are practically everlasting.

First prize, $150 Second prize, $125
Third prize, $ 75 Fourth prize, $ 50
Ten prizes of each, $10

SUGGESTIONS FOR SUBJECTS

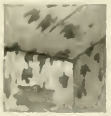
FAILURE OF SUBSTITUTES—



In Roof Drainage—Close-up photographs of rusted leaders and gutters. Take in portion of wall, showing paint spoiled, if any, by rust water from leaking leader or gutter. State kind of metal and how long gutter or leader in use before rust caused it to leak.



In Plumbing—Close-up photograph of section of rusted pipe removed from a plumbing system, showing hole or holes eaten by rust. Photograph showing a pipe closed, or nearly closed, by rust accumulation inside it. Close-up of bathtub, washbowl or sink stained by rust in water from rusty pipes.



Interior Damage—Photographs of wall paper, painted or kalsomined wall or ceiling or other decorations, badly stained, or perhaps of plaster destroyed, by rust leaks resulting from failure to use Copper gutters, flashings, etc., on roof, or Brass pipe and Brass fittings in plumbing system; photograph of a wall, partition, floor or ceiling torn open to get at rusty, leaking pipes, or a similar operation made necessary by failure to use Copper or Brass, which do not rust.



In Building Hardware—Close-up photograph of a door hanging on rusted fragment of a hinge, or a door pried open because a lock rusted shut, a rusted door-knob, rusted letter drop, rusted mail box, rusted hinge, rusted screw, or a rusted example of one of the many other items of merely plated hardware which rust as soon as the thin plating has worn off, become unsightly and perhaps mar paint and injure woodwork with their rust—a condition that is avoided by the use of all Brass or Bronze hardware instead of the dipped, short lived article.

DURABILITY OF COPPER AND BRASS—



In Drainage—Photograph of an old Copper leader still in place or an old Copper gutter still doing duty after many years of service without upkeep or repairs. Do not fail to give date the Copper leader or gutter was put up. Must be at least 35 years old to qualify.



In Roofing—Photograph showing example of the everlasting life of the Copper roof. State number of years the Copper has been in service without upkeep or repairs. Photograph must of course show the roof clearly and cannot qualify unless the Copper has been in place 35 years or more.



In Plumbing, etc.—Photograph of a section of Brass pipe or a brass fitting *still in place* that has been in service 35 years or more without upkeep or repairs.



In Other Uses—Photograph of an item of Brass or Bronze hardware with a long service record, a Brass or Bronze plate, a building ornament of Brass or Bronze, a Copper or Bronze window screen, a Copper cooking utensil, or other Copper, Brass or Bronze article of utility or ornamentation. Must be at least 35 years old.

Get out your camera and look about you for subjects. You will find them everywhere.

Rules of the Contest

Photograph must have been taken by person entering it in the contest. A contestant may enter one or more photographs.

Name and address of contestant and all descriptive matter to be written on the back of the photograph.

Statements as to age and condition of object photographed will be verified before prizes are awarded and contestant should furnish with his or her entry information that will facilitate verification.

The subject need not be the contestant's property, but contestant must have the owner's permission to photograph it for entry in the contest unless the subject be public property.

By "best" photograph in the metals-that-rust class is meant the photograph of a subject which by reason of its condition, short life and interest is believed by the judges to furnish the most interesting object lesson in the error of using other metals where Copper, Brass or Bronze should be used.

By "best" photograph in the Copper-Brass-and-Bronze class is meant the photograph of a subject which by reason of its condition, long life and interest is believed by the judges to furnish the most interesting object lesson in the economy of using Copper, Brass and Bronze, which do not rust.

Where the subject is a part of a building or other structure the contestant may send also a photograph of the structure in which the subject is or was installed if the contestant feels such a photograph, in combination with the subject itself, will lend additional interest to the subject. Every such photograph should carry on its back information identifying it with the item entered.

Contest closes Sept. 1, and all entries must reach the address given below on or before that date. Every photograph received will be promptly acknowledged. Prizes will be awarded within sixty days after closing date.

Prize-winning pictures will be used in a publicity campaign to inform the public on the economy of using Copper, Brass and Bronze, and in entering a photograph the contestant agrees to such use of his entry.

Wrap your photographs carefully, protecting with cardboard, and send to Contest Committee, Copper and Brass Research Association, 25 Broadway, New York.

COPPER & BRASS
RESEARCH ASSOCIATION
25 Broadway - New York

News, Notes and Comment

Philadelphia World's Fair

TO celebrate the 150th Anniversary of our Declaration of Independence, a large international exposition will be held in Philadelphia during the year of 1926. Fairmount Park seems to be the site mostly favored by the different committees, but this has not been definitely decided upon.

In all probability, this will be the largest international exposition ever held, and as many buildings will have to be erected it will certainly be of considerable interest to the construction industry.

From a study made by the committees, it was decided that the following buildings or their equivalent will be essential to a proper presentation of the world advances which have been made during the past 50 years: Manufacturers and Liberal Arts; Machinery, including Electricity; Mines, Metallurgy and Chemistry; Transportation; Agriculture; Fisheries; Food Products; Horticulture; Music, including an auditorium; Art Galleries; Education; Anthropology; United States Government Buildings; Administration Building; State Buildings; Foreign Buildings; Building Arts; Stadium and Drill Grounds; and other necessary buildings for amusements.

It was estimated that the main group of buildings of suitable size included above would require 100 acres of space, and that there would be other buildings incidental but necessary to the group which would increase the area to possibly 150 acres. To this area should be added from 300 to 500 acres additional to provide for various other services, which make a total of from 600 to 800 acres, as the estimated territory required.

A considerable amount of money will be spent for the erection of suitable buildings. What this amount will be has not been estimated, but we might state that $18,000,000 was spent at the Chicago exposition; $16,000,000 at the St. Louis exposition; $14,000,000 at the San Francisco exposition, so therefore, it is safe to say that there will be at least $20,000,000 worth of construction work for this 150th Anniversary exposition.

Book Notices

The High Cost of Cheap Construction: This is a title of a very interesting book of 66 pages; published by Weyerhaeuser Forest Products, St. Paul, Minn. A copy of this book may be had free from the publishers.

This is an interesting book for home builders on the importance of right construction in house building and the practical contractor will find many important points about proper methods of construction in this volume. It is well worth sending for and a careful reading will enable anyone to pick up a fund of valuable information on the little points that are so often neglected in house construction, they have a vital bearing on the lasting qualities of the completed structure.

* * *

House Owners Book: This is a book of 388 pages; by Allen L. Churchill and Leonard Wickenden; cloth bound; published by Funk & Wagnalls Co., New York. Price $2.00 per copy.

This is a rather useful hand book for the intending home builder, which also contains some good practical points for the contractor. Explains how to select a site, finance the building, merits of various materials and systems of plumbing, water supply, lighting, heating, ventilation, etc. It contains many useful points that will help the home builder.

* * *

Steam Heating: A book of 367 pages, 8 x 10½ in.; cloth bound; published by Warren Webster & Co., Camden, N. J. Price $3.25 per copy.

This book is quite a thorough book on the subject of practically all sorts of buildings; contains many tables, rules, data and useful information on every phase of designs and installation of a reliable steam heating system. Many excellent illustrations are used to explain the text. It is the most comprehensive book on the subject that has come to our notice.

Kitchen Ranges

MANY of our suburban towns and rural districts are supplied with electricity but are without gas supply. Any housewife who has used gas for cooking purposes knows its advantages and to do without it is quite an inconvenience. In the summer time oil cook stoves are used when the coal range would prove very uncomfortable.

Electric stoves play an important part here, as they are quick and reliable, but frequently the kitchen is too small to have a separate electric stove. One enterprising manufacturer has perfected a combination coal and electric range that meets the popular demand—it is a perfect coal range complete in every detail of cooking, baking and water heater, besides it has combined with it an electric oven and broiler, three cover units with a plug attachment for connecting to it any electric device such as washing machine, iron, fan, cleaner, etc.

Enterprising builders would do well to examine into this and find out how it would help them in making better kitchens. Please a woman on the kitchen end of her house and she will talk about it to her friends and no builder can have better advertising.

Unequal Pitch Roof

(Continued from page 49)

short common side of the hip and valley rafters are the same pitch.

To lay out the bottom cut so that the jack rafters will fit against the side of the valley rafter at the proper angle, measure forward on a level line from plumb line D, on the side of the rafter, figure 10, the distance D-1, figure 9, and produce plumb line 1, figure 10. Connect plumb line 1 through plumb line D on the center line as shown at 2, top view, figure 10. Cut on line D for the cut against the ridge and on bevel 2 on the top edge and plumb line 1 for the cheek cut against the valley rafter on all five rafters and on rafters Nos. 7 and 8, cut on lines G and B for the birdsmouth and on rafter No. 7, cut on line F, for the plancher level.

Bostwick
TRUSS-LOOP



BOSTWICK "Truss-Loop" effects an **actual saving of money** for the Contractor and Builder in 5 distinct ways, viz.: in Time, Labor, Studding, Lath and Waste Plaster. While more expensive in first cost, BOSTWICK "Truss-Loop" is the cheapest in finished wall cost per square yard, and it **endures.**

The Complete Bostwick Line

"Truss-Loop" Metal Lath
"Diamond A" Expanded Metal
"Niles" Expanded Metal
"Lock" Expanded Metal
"Truss - V - Rib" Re-enforcement
Channel Iron
Corner Bead—Rail
—Standard
—Truss-Wing
Base Bead
Wall Plug
Wall Ties—Y, No. 1, No. 2

Write for prices and full information

The Bostwick Steel Lath Co., Niles, Ohio

Bostwick
BUILDING MATERIALS

VAN GUILDER DOUBLE WALL CO., INC., 20 Engineering Bldg., Rochester, N. Y.

Founders of The Double Concrete Wall

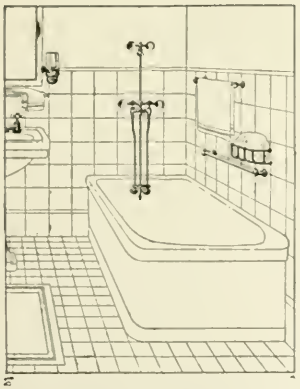
Over eighty Subsidiary Building Companies. New ones organizing continually. The builder controls company and territory. A saving of over one-half the labor cost.

The cost of machines is not the question. It is the quality and cost of the finished product.
We train all our companies; Successful construction Assured.

We have no competition; absolutely in a class by ourselves.
We advocate all Fireproof Construction for the conservation of life and property in the Home.

Established 12 Years

The Carnegie Steel and the Cambria Steel Companies have invested about a MILLION DOLLARS in Van Guilder Double Wall Concrete homes. *Write for particulars*



KENNEY SHOWER

DeLuxe tub model

The ideal home bathing unit for all the family. Combining shower bath supplies and shampoo all in one.

This feature shower turns any tub into a modern bathing unit. Adds beauty to the bathroom and gives the luxury of a shower bath at a big saving.

Save cost and upkeep of curtains, bath cocks, roughing, and reduces water consumption.

Send for catalogue. A Kenney Shower, portable or stationary model to meet every need.

The Kenney-Cutting Products Corp.
507 FIFTH AVE. NEW YORK

This stucco home built by and for R. C. Edwards, Architect, 347 Fifth Ave., New York City.

MICASPAR Crystals were used for the stucco.



MICA SPAR CRYSTALS

is the only

STUCCO DASH and CONCRETE FACING

that is absolutely non-absorbent and non-fading

VARIEGATED tints of Green-Pink-White and Black. Rich tone, and beautiful, permanent lustre, resisting all weather conditions. Takes a firm bedding in the stucco and cement. Distinctive and unusual.



Prices and samples on application

Crown Point Spar Co.,
Incorporated
Dept. B
101 Park Ave.,
New York City

Selected List of Manufacturers' Literature

FOR THE SERVICE OF BUILDERS, CONTRACTORS, ARCHITECTS AND ENGINEERS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to BUILDING AGE & THE BUILDERS' JOURNAL, 920 Broadway, New York, or the manufacturer direct, in which case kindly mention this publication. Either the titles or the numbers may be used in ordering.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

(See also Alphabetical Index, Page 112)

ARCHITECTS' SPECIFICATION HAND BOOK
Truscon Company, Detroit, Mich.
20. 52-page paper-bound, loose leaf specification book. 8½ x 11 in.

ASBESTOS PRODUCTS
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
1. *Ambler Asbestos Shingles. Catalog* 5½ x 8½ in. 40 pp. Illustrated.
2. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog. 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.
3. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog. 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
4 *Ambler Asbestos Building Lumber.* Catalog, 8½ x 11 in. 32 pp. Illustrated.
5. *Engineers' Data Sheets.* Catalog, 8½ x 11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.

ASBESTOS ROOFING—See also Roofing

ASH HOISTS—See also Hoists

ASH RECEIVERS
Sharp Rotary Ash Receiver Corporation, 396 Bridge St., Springfield, Mass.
7. *Catalog E.* Booklet describing the Sharp Rotary Ash Receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6 x 9¼ in.
8. *Catalog F.* A book for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with tables of dimensions for installation. 8 pp. Ill. 6 x 9¼ in.

BALANCES, SASH
Caldwell Mfg. Company, The, Rochester, N. Y.
9. *Suggestions for the Present-Day Architect.* Booklet, 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.
Pullman Mfg. Co., Rochester, N. Y.
10. *Catalog* describes new form of sash balance that can be removed and inserted without removing sash from window.

BAND SAWS
American Saw Mill Machinery Co., Hackettstown, N. J.
11. *Catalog No. 22* describing a general line of band saws of various sizes.
12. *Technical Data.* Four-page folder, 8½ x 11 in. containing specifications, description, prices and approximate cost of installation. Everything the architect or contractor requires. Proper size for filing.
Crescent Machine Co., Leetonia, Ohio.
241. Descriptive 144-page Catalog.

BAR BENDERS AND CUTTERS
Koehring Company, Milwaukee, Wis.
13. *Four-page folder,* giving illustrations and sizes of Koehring Bar Benders and Cutters.

BATHROOM FIXTURES
Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.

BEDS
Murphy Door Bed Company, Majestic Bldg., Chicago, Ill.

BOILERS—See Heating Equipment

BOOKS
Architectural House Planning Service Co., 20 So. 18th Street, Philadelphia, Pa.
Arrow Book Company, 347 Fifth Avenue, New York City.
U. P. C. Book Co., 243 West 39th Street, New York City.

BLUE PRINTS
Peerless Blue Print Co., 347 Fifth Avenue, New York City.

BRICK
American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.
15. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Sent free.
16. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions are illustrated and described. Size 8½ x 11 in. 116 pp. Price $1.00.
17. *The Home of Beauty.* A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8 x 10 in. 72 pp. Price 50 cents.
18. *Architectural Details in Brickwork.* Three series of beautiful half-tone prints of brickwork detail, contained in closed folders suitable for standard vertical letter file. The three series contain 124 prints in all. Size 8½ x 11 in. Price $1.50 per set.
Common Brick Manufacturers' Association of America, 1309 Schofield Bldg., Cleveland, Ohio.
19. *Brick—How to Build and Estimate.* 3rd edition, 32nd thousand, a manual of solid brick and Ideal wall construction, bonds and joints and equipment, and contains complete estimating tables for quantities of brick, mortar, material and approximate mechanics' time for various thicknesses and square foot areas of solid and Ideal wall. 8½ x 11 in. 72 pp. Price 25 cents.
20. *Brick for the Average Man's Home.* Book, 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00.
Fiske & Company, Boston, Mass.
245. Tapestry brick, other grades of front brick. Manufacturers of "Fisklock" Brick.

BUILDING CONSTRUCTION—See also Garage Construction
National Manufacturing Co., Sterling, Ill.
Truscon Steel Company, Youngstown, Ohio.
21. *Truscon Floortype Construction.* Form D-352. Contains complete data and illustrations of Floortype installations. 16 pp. Ill. 8½ x 11 in.
22. *Truscon Standard Buildings.* Form D-398. Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8½ x 11 in.
23. *Truscon Building Products.* Form D-376. Contains a brief description of each of the Truscon Products. 112 pp. Ill. 8½ x 11 in.
24. *Modern School Construction.* Form D-395. Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill. 8½ x 11 in.

BUILDING HARDWARE—See Hardware

BUILDING STONE—See Stone, Building

BUILT-IN CLOTHES HANGERS
Knape & Vogt, Grand Rapids, Mich.

BUNGALOW AND SMALL HOUSE PLANS
American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.
25. *Four booklets* of small houses from 3 to 8 rooms, containing 98 reversible designs. (1) 3-4 rooms, (2) 5 rooms, (3) 6 rooms, (4) 7-8 rooms; size 8½ x 11 in. Each booklet 25 cents, set $1.
Architectural House Planning Service Company, 20 South 18th Street, Philadelphia, Pa.

CANVAS—See Roofing Materials

CASEMENTS—See Doors and Windows

CAULKING AND GLAZING COMPOUND
Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.
246. Illustrated catalog sent on request.

CEILINGS, METAL
The Edwards Manufacturing Company, Cincinnati, O.
33. *Pamphlet* of 32 pages, describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 in.
Keighley Mfg. Co., 124 Third Avenue, Pittsburgh, Pa.

CEMENT
The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.
37. *The Atlas Book on Concrete Construction.* A text book written for the average builder in concrete and from the practical rather than from the technical standpoint. Treats on both plain and reinforced concrete. 144 pp. 4½ x 7 in. Cloth bound. Price $2.00.
30. *Set of Blue Prints.* Drawings showing how to apply Portland Cement stucco to the different standard types of wall construction. Appended are tables of the quantities of cement and sand required to cover a given wall surface. Size 8½ x 11.
31. *Concrete on the Farm.* The most comprehensive book of its kind. Practical and thoroughly reliable instructions, with plans and pictures of all possible farm structures for which concrete can be used. Complete directions in practical terms for selection of aggregates and the mixing and placing of concrete.
32. *Other Publications.* The Atlas Portland Cement Company has numerous other publications, covering nearly every phase of concrete construction. Their Service Department will give sound advice on any phase of concrete construction to anyone applying for it.
Koehring Company, Milwaukee, Wis.
38. *Concrete—Its Manufacture and Use.* Book, 4½ x 7 in. Illustrated. 207 pp. Comprehensive discussion from the practical standpoint of concrete.
Lehigh Portland Cement Co., Allentown, Pa.
40. *The Expense-Proof Farm.* Book of 96 pp. Illustrated. Showing methods of constructing various buildings, fence posts, water troughs, etc., used about the farm.

CHAINS
Bridgeport Chain Co., Bridgeport, Conn.
29. *Catalog No. 14.* Contains 64 pp. Illustrated, of different chains that can be used in all parts of building construction.

CLAMPS
James L. Taylor Mfg. Co., Poughkeepsie, N. Y.

COAL CHUTES
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

COLUMN AND BEAM COVERING
United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

Working Drawings Available to You

This home was designed for a private owner by one of the best residence architects in America.

Sometime ago we published a view of it in one of our books and it attracted so much favorable attention that we had hundreds of requests from all over the country for details and plans.

At last we have prevailed upon the architect to grant us the right of supplying complete working drawings and specifications. These working drawings are exceptionally complete and contain many full size details which make them unusually valuable and different from the ordinary.

Hiawatha's Cost Appeals to Buyers

This home can be built of Brick (solid masonry) for as low as from $9,000 to $13,000 depending upon location and the character of equipment and finish.

After you see the plans in circular No. 705 you should be able to determine the approximate cost of this popular home in your locality. With the complete plans—working drawings—and specifications, which are yours at a nominal price, you can estimate exactly what it will cost to build this home.

Costs Even Less With Ideal Wall

When this home was first built the Ideal Brick Hollow Wall was unknown. Its recent development makes possible the building of this Brick home for even less than the above figures. With the Ideal wall you obtain all the advantages of solid masonry construction at a saving of ⅓ in cost.

The Ideal Wall is thoroughly described in "Brick, How to Build and Estimate"—a 72-page manual of vital information for contractors and builders. It contains 30 tables, 9 full page detail drawings and other information which proves of wonderful assistance in estimating costs quickly and accurately. Only 25 cents postpaid.

The Hiawatha is one of a wide variety of Brick house designs shown in that fascinating volume, "Brick for the Average Man's Home." Here you will find all kinds of homes illustrated and described, together with much helpful information which will prove of great value in interesting prospective home owners, thus helping you to land jobs. The nominal price of $1.00 is to cover printing and distribution costs only.

$1.25 brings both books. Address The Common Brick Industry of America, 2133 Cleveland Discount Building, Cleveland, O.



The Hiawatha

A House You Can Sell Quickly and Profitably

This home is so good looking, practical and economical that it appeals to every one. It is declared by experts to be the finest of its class in America.

Think what a ready market you'd have for such a home if you built it. Think of its greater sales value—its better profit possibilities.

You can now secure complete plans and specifications for this remarkable brick home. Send for free circular No. 705 showing alternate floor plans and giving complete details.



This Trade-Mark Stands for—

Quality—
An honest product, honestly advertised.

Responsibility—
A reputation for honorable, prompt and efficient business dealings.

Service—
A material of proven integrity with a record of ages of service.

The Common Brick Industry *of* America
2133 CLEVELAND DISCOUNT BUILDING
Cleveland, Ohio

The Ideal Brick Hollow Wall is made of standard brick obtainable everywhere

Ideal Brick Hollow Wall

"Brick Homes at the Cost of Frame"

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 68*

COLUMNS

Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.
233. *Catalog No. D-47.* 48 pages, illustrated. 7¼x10 in. Illustrating the Koll's Patent Lock-Joint Wood Columns.

CONCRETE APPLIANCES

Concrete Block Machine & Mold Co., 114 S. 2nd St., St. Louis, Mo.
254. *Catalogue No. 5.* This is a new catalogue describing the Adjustable Steel Culvert Forms. 8-page book, 6 x 10 in.
255. *Catalogue No. 11.* This is a new catalogue describing the new Steel Burial Vault Molds. It is 8 pages, 6 x 10 in.

Universal Cement Mould Co., No. Milwaukee, Wis.
41. *Illustrated Folder* describing mold for building hollow concrete walls for homes, garages, barns, silos, etc.

Van Guilder Double Wall Co., 77 South Avenue, Rochester, N. Y.
42. *A Catalog* describing the Van Guilder system of portable forms for the building of hollow concrete walls on the thermos bottle idea for the erection of homes, tee houses, barns, silos, etc. Walls are dry, as there is continuous air space around entire building.

CONCRETE MACHINERY

A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
43. *Descriptive Illustrated Circular* of Magic Concrete Mixer.

The American Cement Machine Co., Inc., Keokuk, Iowa.

Badger Concrete Mixer Co., Majestic Bldg., Milwaukee, Wis.

Concrete Equipment Co., 535 Ottawa Street, Holland, Mich.

Concrete Block Machine & Mold Co., 114 S. 2nd Street, St. Louis, Mo.
253. *Catalogue No. 38.* Describes Building Block Machines. It is a 40-page book, 6 x 10 in.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.

Ideal Concrete Machinery Co., 1334 Monmouth Street, Cincinnati, Ohio.

Jaeger Machine Co., 216 Dublin Avenue, Columbus, Ohio.

Koehring Co., Milwaukee, Wis.
46. *Koehring Construction Mixers.* Booklet. 7¾ x 10½ in. Illustrated. 96 pp. Complete information on construction type concrete mixers.
47. *Koehring Dandie Mixer.* Booklet, 6 x 9 in. Illustrated. 24 pp. Illustrating and describing Koehring line of Dandie light mixers.
265. *"Built to Endure."* A beautifully bound booklet of 36 pages, 7¼ x 10 in., describing Comparative Examples of Notable Ancient and Modern Construction Embodying the Element of Permanency.

Little Whirlwind Mixer Co., 438 Gould Street, La Crosse, Wis.

Republic Iron Works, Box 602, Tecumseh, Mich.

Standard Scale & Supply Co., 1631 Liberty Avenue, Pittsburgh, Pa.

CONCRETE MARBLE

Art Stone Co., Waynesboro, Pa.
45. *Descriptive Circulars* with illustrations of different marbles in colors. Sent free to any interested party.

CONSTRUCTION, FIREPROOF

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
226. *Standard Fire Proofing Bulletin* 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fireproof floor construction.

National Pressed Steel Co., Massilon, Ohio.

United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
48. *Pyrobar Gypsum Tile.* Booklet, 8½ x 11 in. 32 pp. Illustrated. Detail and specifications for fireproof partitions.
49. *Bulletins*, 8½ x 11 in. Containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

CONTRACT AND ESTIMATE BLANKS

L. Fink & Sons Printing Co., Laurel Spring, N. J.
166. *Catalog and Samples* of contract sheets, estimate blanks, job tickets, time sheets, wage receipts, etc., with prices.

CRYSTALS, MICASPAR

Crown Point Spar Co., 101 Park Avenue, New York.
265. *50-page descriptive catalog* describing the advantages and uses of the Sparkling Micaspar Crystals.

DAMPERS AND ASH DUMPS (Fireplace)

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

Stover Mfg. & Engine Co., 747 Lake Street, Freeport, Ill.

DAMP-PROOFING

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

Cortright Metal Roofing Co., Philadelphia, Pa.

Illinois Zinc Co., 280 Broadway, New York.

National Sheet Metal Roofing Co., 339 Grand Street, Jersey City, N. J.

Rocbond Co., Van Wert, Ohio.

F. C. Sheldon Slate Co., Granville, N. Y.

DOOR CHECKS

Park Manufacturing Co., Worcester, Mass.
50. *Catalog* contains description of six models of the new improved Worcester-Blount Door Check.

DOORS AND WINDOWS

The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.
247. BOCA steel sash. (E-22). A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.

Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.

Hess Warming & Ventilating Co., 1201 Tacoma Bldg., Chicago, Ill.

Henry Hope & Sons, 103 Park Ave., New York.
51. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of

Truscon Steel Company, Youngstown, Ohio.
52. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.
53. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill. 8½ x 11 in.

DOOR AND WINDOW FRAMES

Andersen Lumber Company, South Stillwater, Minn.
55. *General Catalog* for architects, contractors, engineers, carpenters or builders. Describes and illustrates fully Andersen Standard White Pine Window, Cellar Frames, Sash Frames and Door Frames. Gives details of construction, variety of sizes and uses for ordinary as well as special construction, and method of assembly. Size 7¾ x 10¾, 24 pages.
56. *Better Frames for Less Money* for consumers. Interesting folder showing advantages of Andersen Standard White Pine Frames. Uses, sizes and details of construction.

DRAFTING MATERIALS

A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.

Keuffel & Esser Co., Hoboken, N. J.

Peerless Blue Print Co., 347 Fifth Avenue, New York City.

Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.

DUMBWAITERS

Kimball Bros. Co., 1106 Ninth Street, Council Bluff, Iowa.

Sedgwick Machine Works, 156 W. 15th Street, New York.
57. High grade Hand Power Elevators and Dumbwaiters for All Purposes. Illustrated catalog, 32 pages; dumbwaiter service sheet, and pamphlets descriptive of many special types of outfits.

ELECTRIC METER BOXES

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

ELEVATORS

Kimball Brothers Company, Council Bluffs, Iowa.
58. *Kimball Elevators.* An illustrated catalog of hand power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7¾ x 10½ in.

Richards-Wilcox Mfg. Co., Aurora, Ill.
59. *"Ideal" Elevator Door Equipment.* Catalog showing elevator door hangers for one, two or three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.

Sedgwick Machine Works, 156 West 15th Street, New York.

FACTORY EQUIPMENT

The Edwards Mfg. Co., Cincinnati, Ohio.
60. *Edwards' Steel Equipment.* Illustrated catalog. Showing steel lockers and shelving for factories, offices, stores, schools and hospitals, together with illustrations and description of "Edmanco" steel office furniture and filing cabinets. Size 8 x 11 in. 32 pp.

FIREPLACES AND MANTELS

Apex Fireplace Co., Urbana, Ill.

Stover Mfg. & Engine Co., 747 Lake Street, Freeport, Ill.

Strait & Richards, Inc., Newark, N. J.
62. *Catalog* describing fireplaces, electric and gas logs, heatings supplies, heaters, etc.

FLOOR HARDENERS

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
61. *Agster and Its Performances.* Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FLOORING LUMBER

The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
63. *The Perfect Floor.* Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5½ x 7⅝ in.

Oak Flooring Advertising Bureau, 1014 Ashland Block, Chicago, Ill.
64. *Modern Oak Floors.* Booklet. 6⅛ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
65. *Oak Flooring, How and Where to Use It.* Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.
257. *Oak Flooring for Factories and Warehouses.* Booklet. 3¼ x 6 in. 16 pp. Illustrated. Small general book featuring No. 2 Common Oak Flooring for hard usage in factories and warehouses, with testimonials.

Pacific Lumber Co., 2070 McCormick Bldg., Chicago, Ill.

United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.
66. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins, 8½x11. Pyrofill.

Wood Mosaic Co., New Albany, Ind.
227. *Catalogue* of wood-carpet, strips, plain and ornamental parquetry, tongue and groove flooring in natural wood colors.

FLOORING COMPOSITION

Everlasbestos Flooring Co., Rochester, N. Y.

National Kellastone Co., 155 East Superior Street, Chicago, Ill.

FLOOR SURFACING

Amer. Floor Surfacing Machine Co., 521 So. St. Clair Street, Toledo Ohio.

Waywell Chappell & Co., 137 No. Jackson Street, Waukegan, Ill.

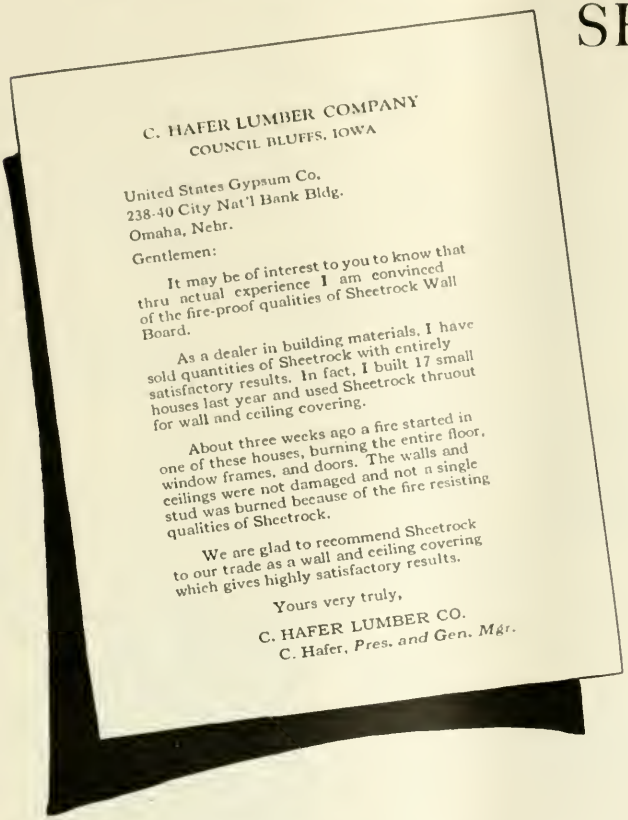
M. L. Schleuter, 223 W. Illinois Street, Chicago, Ill.

FLOOR VOIDS FOR USE IN CONCRETE

United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.
67. *Loose-leaf Bulletins.* 8½ x 11. Pyrobar Gypsum Floor Tile.

"Not a Single Stud Was Burned"—

The Walls Were Covered With SHEETROCK



C. HAFER LUMBER COMPANY
COUNCIL BLUFFS, IOWA

United States Gypsum Co.
238-40 City Nat'l Bank Bldg.
Omaha, Nebr.

Gentlemen:

It may be of interest to you to know that thru actual experience I am convinced of the fire-proof qualities of Sheetrock Wall Board.

As a dealer in building materials, I have sold quantities of Sheetrock with entirely satisfactory results. In fact, I built 17 small houses last year and used Sheetrock thruout for wall and ceiling covering.

About three weeks ago a fire started in one of these houses, burning the entire floor, window frames, and doors. The walls and ceilings were not damaged and not a single stud was burned because of the fire resisting qualities of Sheetrock.

We are glad to recommend Sheetrock to our trade as a wall and ceiling covering which gives highly satisfactory results.

Yours very truly,

C. HAFER LUMBER CO.
C. Hafer, *Pres. and Gen. Mgr.*

You, too, can count on "highly satisfactory results" if you use Sheetrock, the fireproof wallboard. It won't burn, because it is made from gypsum rock. Neither will it warp, shrink nor buckle. Due to the special USG process Sheetrock saws and nails the same as lumber. It makes tight-jointed, smooth-surfaced walls and ceilings which take any decoration perfectly. Your dealer in lumber or in builders' supplies can supply you with Sheetrock. Send for a sample of Sheetrock and for a plan that will help you get Sheetrock jobs Mail the coupon *today!*

Sheetrock is inspected and approved by The Underwriters' Laboratories, Inc.

USG SHEETROCK

Reg. U. S. Pat. Off.

The FIREPROOF WALLBOARD

UNITED STATES GYPSUM COMPANY, *General Offices:* Dept. H, 205 W. Monroe St., Chicago, Ill.
World's Largest Producers of Gypsum Products

SALES OFFICES: New York, N. Y., Buffalo, N. Y., Boston, Mass., Washington, D. C., Philadelphia, Pa., Pittsburgh, Pa., Cleveland, Ohio, Cincinnati, Ohio, Detroit, Michigan, Milwaukee, Wisconsin, Minneapolis, Minnesota, St. Louis, Missouri, Kansas City, Missouri, Omaha, Nebraska, Denver Colorado, Los Angeles, Calif

MINES AND MILLS: Oakfield, N. Y., Plasterco, Va., Cleveland, Ohio, Gypsum, Ohio, Genoa, Ohio, Detroit, Mich., Alabaster, Mich., Grand Rapids, Mich., Milwaukee, Wisconsin, Fort Dodge, Iowa, Blue Rapids, Kas., Southard, Okla., Eldorado, Okla., Piedmont, S. D., Loveland, Colo., Denver, Colorado, Arden, Nevada, Amboy, Calif.

Sheetrock comes in standard sizes: 3/8 inch thick, 32 or 48 inches wide and 6 to 10 feet long

UNITED STATES GYPSUM CO.
Dept. H, 205 W. Monroe Street, CHICAGO, ILL.

I am interested in knowing more about Sheetrock—please send sample.

Name _____

Address _____

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 70*

GARAGE CONSTRUCTION
National Mfg. Co., Sterling, Ill
248. Catalog of Garage Hardware.

GARBAGE DESTROYERS
Kerner Incinerator Company, 1027 Chestnut Street, Milwaukee, Wis.
68. *The Sanitary Elimination of Household Waste.* M-3 Folder. Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. 4 x 9 in.

GARBAGE RECEIVERS.
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

GLASS
American Window Glass Co., Pittsburg, Pa.
69. Send for circular describing different varieties of window glass and how to select the proper kind.
American Three-Way Luxfer Prism Co., Cicero (Chicago), Ill.
70. Write for details and prices of glass prisms that will project daylight into dark interiors.
71. Other literature with reference to apartment house installations.
Plate Glass Mfgs. of America, 1st Nat'l Bank Bldg., Pittsburgh, Pa.
258. *"Glass and Glazing."* 52 pp. illustrated catalog. 5½ x 9 in. This booklet aims to present a standard for the architect, owner or contractor, by which the material may be better known. It also describes the more important and different kinds of glass for building purposes, with regard to adaptability for certain definite uses.

GYPSUM
United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.

HARDWARE
Bridgeport Brass Co., Bridgeport, Conn.
Caldwell Mfg. Co., 5 Jones Street, Rochester, N. Y.
Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.
Griffin Mfg. Co., Erie, Pa.
Hess Warming & Ventilating Co., 1204 Tacoma Building, Chicago, Ill.
240. 24-*Page Illustrated Catalog.* 4x6 in. Describing the Sanitary Medicine Cabinet, Lockers and Lavatory Mirrors.
H. B. Ives Co., New Haven, Conn.
The Kawneer Co., Niles, Mich.
72. *Kawneer. Simplex Window Fixtures.* Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½ x 10¾ in. 16 pp.
Knape & Vogt Mfg. Co., Grand Rapids, Mich.
73. Garment Hangers. Send for illustrated booklet.
F. E. Myers & Bro. Co., Ashland, Ohio.
National Mfg. Co., Sterling, Ill.
National Mill & Lumber Co., 2 Rector Street, New York.
Richards-Wilcox Mfg. Co., Aurora, Ill.
75. *Modern Hardware for Your Home.* Catalog of hangers for varnishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Slidetite" garage door hardware. 24 pp. Illustrated. 8½ x 11 in.
Sargent & Company, New Haven, Conn.
The Stanley Works, New Britain, Conn.
76. *Wrought Hardware.* New 1921 Catalog. This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 676 pp. Illustrated. 6½ x 9½ in.
77. *Garage Hardware.* Booklet, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustration and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.
78. *Eight Garages and Their Stanley Hardware.* Booklet. Plans, drawings and complete hardware specifications. Size 5 x 7 in. 32 pp.
79. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in. 32 pp.
Upson Company, Lockport, New York.

HEATING EQUIPMENT
Co-operative Foundry Co., Rochester, N. Y.
230. Manufacturers of pipeless furnace.
The Farquhar Furnace Company, Wilmington, Ohio.
80. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Illustrated. 4¾ x 9¼ in.
81. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Illustrated. 8½ x 11 in.
Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.
Hess Warming & Ventilating Co., 1205D Tacoma Building, Chicago, Ill.
82. *Modern Furnace Heating.* Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.
Holland Furnace Co., Holland, Mich.
230. 24-*Page Illustrated Catalog.* Containing some sound advice on the heater and some miscellaneous points.
Kelsey Heating Company, James Street, Syracuse, N. Y.
83. *Booklet No.* 5. 4 x 9. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.
84. *Monroe Pipeless Booklet.* 4½ x 8 in. 20 pp. Illustrated.
85. *Monroe Tubular Heater.* Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
86. *Syracuse Pipeless Booklet.* 4½ x 8 in. 12 pp. Illustrated. General Booklet giving sizes and capacities.
87. *Valves, Syphons and Traps.* A series of pamphlets to enclose in envelopes, describing the well known Thermostatic Return Line Valves and other heating equipment specialties made by this company.
Magee Furnace Co., Boston, Mass.
259. *Illustrated booklet* describing the new heater. The Magee Furnace Co. have been very successful with their coal, gas and electric combination ranges which they manufacture in various styles and sizes. As they express it, they have just produced a new member in their electric family which they call the ElectriGas. This is a very compact and attractive electric and gas range. The electric half comprises an insulated electric oven or fireless cooker of good size and an electric broiler. These are controlled from electric switches in front on their patented switchboard. The Gas half includes four gas burners and a simmerer which are automatically lighted from a push button. These ranges are made in ebony black or pearl gray por-cel-a finish. The sales department of the Magee Company report that great interest is being shown in this ElectriGas range all over the country. There are so many good talking points and attractive features in the Magee ElectriGas that it will undoubtedly prove a great seller. This range is also made in straight electric and straight gas, as well as in this combination.
Sill Stove Works, Rochester, N. Y.
Strait & Richards, Inc., Newark, N. J.
88. *Catalog* describing fireplaces, electric and gas logs, heaters, etc.

HOISTS—See Elevators
American Saw Mill Machinery Co., Hackettstown, N. J.
89. *Bulletin No.* 10 describing several kinds of builders' hoists.
The Brown & Clutch Co.
262. 16-*page illustrated booklet*, 3½ x 9 in., describing the various model hoists manufactured by "Brown & Clutch."
C., H., and E. Mfg. Co., Milwaukee, Wis.
90. *Bulletin No.* 3. Hoists and Mortar Mixers.

HOLLOW TILE
Fiske & Company, Boston, Mass.
National Fire Proofing Co., Pittsburgh, Pa.

INCINERATORS—See Garbage Destroyers

INSULATION
Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
92. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.
Samuel Cabot, Inc., 141 Milk St., Boston, Mass.
249. Cabot's Quilt Catalog containing drawings and description.
United States Mineral Wool Co., 280 Madison Avenue, New York, N. Y.
94 *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼ x 6⅛ in. 24 pp.

JOISTS AND STUDS, PRESSED STEEL
General Fireproofing Co., Youngstown, Ohio.
National Pressed Steel Co., Massillon, Ohio.
96. *Descriptive 4-page folder* on metal lumber for building construction.
Truscon Steel Company, Youngstown, Ohio.
95. *Truscon Steel Joists.* Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

KITCHEN EQUIPMENT
National Mill & Lumber Co., 2 Rector Street, New York.
256. 10-*Page Illustrated Folder.* Describes the necessity and advantages of a National Built-In Ironing Board.

LATH, METAL AND REINFORCING
Buffalo Wire Works Co., Inc., 446 Terrace, Buffalo, N. Y.
250. Write for Booklet 61-F on wire lathing.
General Fireproofing Co., Youngstown, Ohio.
97. *Catalog* describes Herringbone Rigid Metal Lath, how it is applied and used, with detailed drawings, specifications, etc. 32 pp.
National Pressed Steel Co., Massillon, Ohio.
Truscon Steel Co., Youngstown, Ohio.
99. *Hy-Rib and Metal Lath.* 18th Edition. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

LEVELS
A. S. Aloe Co., 513 Olive Street, St. Louis, Mo.
L. Beckman Co., 1004 Jackson Street, Toledo, Ohio.
Eugene Dietzgen Co., 162 W. Monroe St., Chicago, Ill.
Keuffel & Esser Co., Hoboken, N. J.
Warren-Knight Company, 136 North 12th St., Philadelphia, Pa.
100. *"Sterling" Levels and Transits.* 32 pp. illustrated catalog. Description, specifications and structural advantages required in modern practice for establishing lines, levels, angles, etc. Vest Pocket Manual of adjustments.
David White Co., 907 Chestnut Street, Milwaukee, Wis.

LIGHTING
American Three-Way Prism Co., 1307 South 55 Court, Cicero, Ill.
98. *Descriptive Circular* on the use of prisms for directing light to dark corners.

LIGHTNING RODS
E. G. Washburne Co., 207 Fulton Street, New York.
232. *Descriptive Catalog in Colors.* Showing different designs of weather vanes, lightning rods, ventilators, etc.

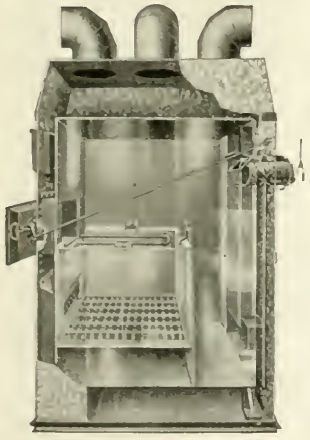
LIGHTING SPECIALTIES
I. P. Frink, Inc., 24th Street and 10th Avenue, New York, N. Y.
250. *Lighting Service for Hospitals.* A booklet illustrated with photographs and drawings, showing the types of lights for use in hospitals, as operating table reflectors, linolite and multilite

Nothing is exclusive

about the sale of

Hess Welded Steel Furnaces

¶The price is based on cost, plus a moderate factory profit. We do not offer them through jobbers nor agents but we deal direct with local contractors and dealers, and others. If we plan the layout for any heating job, WHICH WE WILL GLADLY DO WITHOUT CHARGE, our binding guarantee of successful results will apply, no matter who installs the work.



¶Thousands of Hess Furnaces are in use everywhere (12,000 in Chicago alone,) planned and guaranteed by us.

¶Better service cannot be bought at any price and contractors in every neighborhood are buying and installing, with profit to themselves and satisfaction to their clients.

Write for our 48 page heating booklet (new edition). It's free

HESS WARMING & VENTILATING CO.

1201 H., Tacoma Bldg., Chicago, Ill.

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 72*

concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses. Size 7 x 10 in. 12 pp.

251. *Frink Reflectors and Lighting Specialties for Stores.* Catalog No. 424. A catalog containing a description of the Frink Lighting System for Stores; the Synthetic System of Window Illumination; and a number of appliances to produce the most effective lighting of displayed objects. 20 pp. Illustrated. 8 x 11 in.

252. *Frink Lighting Service for Banks and Insurance Companies.* Reflectors. Catalog No. 425. A very interesting treatise on the lighting of offices; with details of illustrations and description of lamps and reflectors. Contains a list covering several pages, of banks using Frink Desk and Screen Fixtures. 30 pp. Illustrated. 8¼ x 11 in.

LUMBER

Arkansas Soft Pine Bureau, 802 Boyle Building, Little Rock, Ark.

101. *Arkansas Soft Pine Handbook.* Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Molding Designs.

102. *The Home You Long For.* Booklet. 8¼ x 11 in. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.

Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.

104. *The Post Everlasting.* Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.

228. *Poles That Resist Decay.* Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.

105. *"From Tree to Trode,"* a 48-page illustrated description of the manufacture of lumber from tree to use. Describes methods of logging, construction, etc.

Pacific Lumber Company of Illinois, The, 1105 Lumber Exchange Building, Chicago, Ill.

106. *Engineering Digest.* Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipes, Outbuildings, Irrigation Flumes, Drainage Boxes, Greenhouses, etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.

Southern Cypress Mfrs. Assn., 1227 Poydras Bldg., New Orleans, La.

107. *Many interesting booklets* on the use of Cypress for all purposes.

Weyerhaeuser Forest Products, St. Paul, Minn.

LUMBER ASBESTOS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

108. *Ambler Asbestos Building Lumber.* Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½ x 11 in. 32 pp.

MARBLE, ARTIFICIAL

Art Stone Co., Waynesboro, Pa.

METAL LATH—See Lath, Metal and Reinforcing

METALS AND METAL BUILDING SPECIALTIES

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.

111. *Reference Book.* Pocket Edition. 2½ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.

113. *Apollo and Apollo-Keystone Galvanized Sheets.* Catalog. 8½ x 11 in. 20 pp. Illustrated.

114. *Research in the Corrosion Resistance of Copper Steel.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.

115. *Facts Simply and Briefly Told.* Bonklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.

116. *Black Sheets and Special Sheets.* Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc. Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

The Donley Bros. Co., 7400 East 74th Street, Cleveland, Ohio.

237. *28-Page Illustrated Catalog* on "Donley Devices and Building Specialties." 6 x 9 in.

N. & G. Taylor Co., Philadelphia, Pa.

117. *Booklet and Detail Sheet of Tin Roofing.* See Roofing.

METAL TRIM—See Doors, Windows and Metal

MILLWORK—See also Lumber—Building Construction—Doors and Windows

MORTAR—See also Cement

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.

118. *Clinton Mortar Colors.* Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

PACKAGE RECEIVER

The Donley Bros., 3700 East 74th Street, Cleveland, Ohio.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Samuel Cabot, Inc., Mfg. Chemists, 141 Milk Street, Boston, Mass.

S. C. Johnson & Son, Racine, Wis.

122. *The Proper Treatment for Floors, Woodwork and Furniture.* Booklet. 6¼ x 8¾ in. 32 pp. Illustrated in color. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.

123. *Portfolio of Wood Panels.* 5½ x 10¾ in. 14 pp. A portfolio containing actual panels of finished woods. Also contains valuable information on finishing and re-finishing floors and woodwork.

John Lucas & Co., Inc.

264. *100-page "Descriptive Catalog."* 6 x 9 in. Published for the purpose of familiarizing "Lucas" distributors with the characteristics, purposes and uses of "Lucas Paints and Varnishes."

National Lead Co., 111 Broadway, New York City.

124. Handy Book on Painting. Book 5½ x 3¼ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal, etc., both interior and exterior.

Eugene E. Nice & Company, 268 South Second Street, Philadelphia, Pa.

125. *Price List "CO1"* contains descriptions of various paints, japans, varnishes, glue, stains, varnish remover, etc. 48 pp. Pocket size. Sent to any address.

Ripolin Co., The, Cleveland, Ohio.

256. *Ripolin Specification Book,* 8 x 10¼ in., 12 pp. Complete architectural specifications and general instructions for the application of Ripolin, the original Holland Enamel Paint. Directions for the proper finishing of wood, metal, plaster, concrete, brick and other surfaces, both interior and exterior, are included in this Specification Book.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

131. *Spread the Sunshine Inside.* Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories.

PARTITION STEEL

Empire Steel Partition Co., College Point, Long Island, N. Y.

PARTITION SYSTEM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

133. *Loose leaf bulletins,* 8½ x 11 in. Jester-Sackett, consists of plaster board applied to metal channels with special clip, ready for plastering.

PARTITION TILE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

134. *Fireproof.* 32-page booklet, 8¼ x 11 in., including description, specifications, and working details of Pyrobar partition tile.

PLASTER BOARD

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

135. *Pamphlets,* describes Sackett Plaster Board used instead of wood or metal lath.

PLASTER—(Interior)

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

PERGOLAS

Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.

235. *Album No. 33.* 7½ x 10½ in. 42 pages of illustrated literature regarding the various types of Pergolas.

PLASTER, INTERIOR

National Kellastone Co., 155 East Superior Street, Chicago, Ill.

PLUMBING SUPPLIES

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

Hess Warming & Ventilating Co., 1205D Tacoma Bldg., Chicago, Ill.

136. *Hess Sanitary Steel Medicine Cabinets.* Booklet. 4 x 6 in. 16 pp. Illustrated.

B. Karol & Sons Co., 806 So. Kedzie Avenue, Chicago, Ill.

Trenton Potteries Co., Trenton, N. J.

257. *Our New Catalog Shows These Details.* If our new Catalog R is not on your desk by all means send for a copy. Architects who have seen it quite generally pronounce it the most completely comprehensive catalog of plumbing fixtures in their experience. Not only are complete specifications given, but the detail drawings are invaluable in showing exactly how and when a certain type should be used.

PUMPS

C. H. & E. Mfg. Co., Milwaukee, Wis.

251. Bulletin No. 2. Pumps.

The F. E. Myers & Bro. Co., Ashland, Ohio.

137. *General Catalog.* 6 x 9 in. 392 pages. Shows complete line of Myers Products—Pumps for Every Purpose, Hay Tools, Door Hangers, Store Ladders, etc. Of particular interest to hardware and implement dealers; plumbers, architects, contractors and builders; mill, mine, factory and railway superintendents and purchasing agents; highway contractors and builders.

138. *Catalogs.* 6 x 9 in. Devoted to separate lines: No. 55, Pump—Hand and Power Pumps; No. PP-55, Power Pumps; No. HT-55, Hay Tools, Door Hangers and Store Ladders; No. HP-22, Hydro-Pneumatic Pumps, Electric House Pumps, Direct Water Systems; No. SOP-21, Self-Oiling Power Pumps; No. MC-21, Cylinder and Working Barrels; No. SP-22, Spray Pumps and Spraying Accessories. All catalogs fully illustrated.

REFRIGERATION

McCray Refrigerator Co., 2264 Lake Street, Kendallville, Ind.

ROOF DECKS

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

139. *Loose leaf bulletins.* 8½ x 11. Describing Pyrobar Roof Tile, which is laid directly on purlins or tee irons, joints grouted, and is then ready for roof covering.

ROOFING MATERIALS

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.

American Sheet & Tin Plate Company, Pittsburgh, Pa.

140. *"Better Buildings."* Catalog. 8½ x 11 in. 32 pp. Describing Corrugated and Formed Sheet Steel Roofing and Siding Products—Black, Painted and Galvanized; together with directions for application of various patterns of Sheet Steel Roofing in various types of construction.



Roof stained with Cabot's Creosote Stains. Walls finished with Old Virginia White. Lined with Cabot's Quilt for warmth
Prentice Sanger, Architect, New York

For Roofs, Siding, Timbers and all Other Outside Woodwork

Cabot's Creosote Stains

They have proved their merit in every climate for nearly forty years. The colors are soft, rich and harmonious, the Creosote penetrates the wood, preserves it, and makes it less inflammable. Shingles make the warmest and cheapest outside finish, and a shingled house stained with Cabot's Stains is the ideal, cozy American country home.

Cabot's Insulating Quilt

A scientific heat insulator and sound-deadener that makes houses warmer in winter and cooler in summer and deadens sounds in floors and partitions. Not a mere felt or paper, but a non-conducting mat that is about thirty times warmer than common papers.

You can get Cabot's Stains and Quilt all over the country. Send for samples and names of nearest agents.

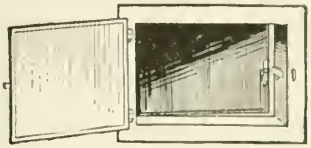
SAMUEL CABOT, Inc., Mfg. Chemists
BOSTON, MASS.
342 Madison Av., N. Y. 24 W. Kinzie St., Chicago
Cabot's Conservo Wood Preservative, Stucco Stains, Brick Stains, Damp-Proofing



Housewives Deserve

a little freedom from their exacting duties—without worrying about the expected delivery. Build a Donley Package Receiver into the new home and the wife will *know* she will find the package safe on her return and she will think gratefully of you, too.

Send for Literature describing all the Donley Devices including



The Donley Package Receiver

DONLEY DAMPERS · PACKAGE RECEIVERS · COAL CHUTES · METER BOXES · GARBAGE RECEIVERS

ASH DUMPS AND FIREPLACE SPECIALTIES

The DONLEY BROTHERS Co.
BUILDING SPECIALTIES
3700 EAST 74TH ST. CLEVELAND

METAL COLUMNS AND STRUCTURAL SPECIALTIES

DONLEY DEVICES *Modernize the Home*



Note its ruggedness

The Bessler Movable Stairway is built for service. Strength and sturdiness are incorporated into every part.

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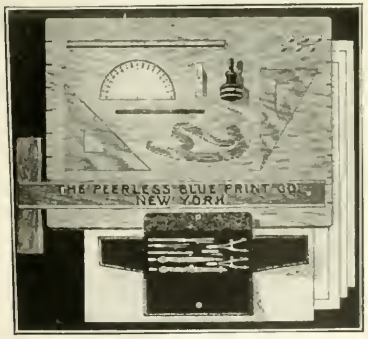
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SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 74*

112. *Copper—Its Effect Upon Steel for Roofing Tin.* Catalog 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

141 *Specifications and Price List.* Descriptive booklet. Details of Ambler Asbestos Cement Roofing Slates, "Century" Asbestos Shingles and Asbestos Corrugated Sheathings. Tables and drawings. Size 6 x 9 in. 44 pp.

142. *Ambler Asbestos Corrugated Roofing.* Catalog gives complete data for specifying, drawings, methods of applications, tables, etc. Size 8½ x 11 in. 20 pp.

Wm. L. Barrell Co. of N. Y., Inc., 50 Leonard Street, New York.

143. *Prepared Canvas for Roofing.* Samples can be obtained on application. A canvas for every use.

John Boyle & Co., Inc., 112-114 Duane Street, New York, N. Y.

154. *Boyle's Bayonne Roof and Deck Cloth.* List B 93. A prepared roofing canvas guaranteed waterproof for decks and the roofs and floors of piazzas, sun-parlors, sleeping porches, etc.

Copper & Brass Research Association, 25 Broadway, New York City.

267. *"How to Build a Better Home."* 36-page illustrated catalog. 8 x 10½ in. This not only describes but teaches the prospective buyer the essential facts of building, finance, hardware and roofing.

Cortright Metal Roofing Co., Philadelphia, Pa.

236. Four-page circular describing the various shingles.

Creo-Dipt Company, 1025 Oliver Street, North Tonawanda, N. Y.

153. *Standard Stained Shingle.* Samples of different kinds mailed on request.

154. *Architectural Service Sheets.* 8½ x 11 in. Illustrated. Working drawiogs of construction, with standard specifications for design and construction of same.

Edwards Mfg. Co., 423 Eggleston Avenue, Cincinnati, Ohio.

E. G. Hussey & Co., Pittsburgh, Pa.

227. *Copper Roofing and Flashings.* Book No. 6. 34 pp.

Illinois Zinc Company, 280 Broadway, New York, N. Y.

155. *Pure Rolled Zinc.* (Corrugated and Plain Sheets.) Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Facts regarding adaptability of zinc for roofing. Specifications of corrugated zinc sheets. Weights per square. Comparative gauge lists.

156. *The Roof That's Always New.* Booklet. 3¾ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley, ridge and hip piece.

National Sheet Metal Roofing Co., 339 Grand St., Jersey City, N. J.

159. *Manufacturers of Metal Shingles* in various designs, both in painted tin or galvanized iron. Samples sent to interested parties.

Richardson Co., Lockland, Cincinnati, Ohio.

F. C. Sheldon Slate Co., Granville, N. Y.

N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.

160. *Selling Arguments for Tin Roofing.* Booklet. 6½ x 9½ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

161. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins. 8½ x 11. Pyrofill.

Vendor Slate Co., Easton, Pa.

Vulcanite Roofing Co., Buffalo, N. Y.

RULES

A. S. Aloe, St. Louis, Mo.

Eugene Dietzgen Co., 162 Ft. Monroe Street, Chicago, Ill.

Keuffel & Esser, Hoboken, N. J.

Sargent & Co., New Haven, Conn.

Stanley Rule & Level Co., New Britain, Conn.

SASH CHAINS, HOOKS AND ATTACHMENTS

The Bridgeport Chain Co., Bridgeport, Conn.

209. *An interesting catalog* describing fully Sash Chain in Steel (six sizes and six finishes), in Bronze (six sizes), Hooks and Sash Chain Attachments.

SASH CORD

Samson Cordage Works, Boston, Mass.

SAW MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.

162. *Catalog No.* 21, describing Circular Saws of all sizes.

163. *General Catalog No.* 22 and *special Bulletin No.* 77, describing sawing machinery for use on the job in the shop.

W. F. & John Barnes Co., 71 Ruddy Street, Rockford, Ill.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.

164. *Bulletin No.* 1, *Saw Rigs.*

Crescent Machine Co., 206 Main Street, Leetonia, Ohio.

Huther Bros. Saw Mfg. Co., Rochester, N. Y.

C. E. Jennings Co., 321 Winthrop Avenue, New Haven, Conn.

Parks Ball Bearing Machine Co., Station A, Cincinnati, Ohio.

Sidney Machine Tool Co., Sidney, Ohio.

SCREENS

American Wire Fabrics Company, 208 South La Salle Street, Chicago, Ill.

165. *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enamel, galvanized, galvanoid, American bronze. 30 pp. Illustrated. 3½ x 6¼ in.

SHEATHING

Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.

171. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.

Porete Mfg. Co., 20 Verona Avenue, Newark, N. J.

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

173. *Eight-page Folder.* Describes Adamant Sheathing Board for use instead of wood sheathing.

SHINGLES—ASPHALT

Winthrop Tapered Asphalt Shingles, 19 So. La Salle St., Dept. No. D-20, Chicago, Ill.

SHINGLES—METAL

Cortright Metal Roofing Co., 50 North 23rd Street, Philadelphia, Pa.

174. *"Concerning That Roof."* A complete catalog describing and illustrating Cortright Metal Shingles and Trimmings. 7 x 10¼ in. 32 pp.

SHOWERS, CURTAINLESS

Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.

260. *4-page File and Reference Sheet* describing six different models of the shower.

261. *Six-page folder* embodying the slogan, "A Bath a Day Keeps You Fit Every Way."

SLATE—See also Roofing

Knickerbocker Slate Corp., 153 East 38th Street, New York, N. Y.

F. C. Sheldon Slate Co., Granville, N. Y.

175. *Commercial and Architectural Roofing Slate* in all colors and textures. Also blackboards, structural and electrical slate. Slate Granules.

Vendor Slate Co., Easton, Pa.

STAIRWAYS

Bessler Movable Stairway Co., Akron, Ohio.

169. *Illustrated catalog,* containing 24 pp., describes how the Bessler Movable Stairway saves floor space and adds an extra convenience to the home.

STANDARD BUILDINGS

Truscon Steel Co., Youngstown, Ohio.

176. *Truscon Standard Buildings.* Fourth Edition. Catalog. 8½ x 11 in. 40 pp. Illustrated. Erection details, cross-section diagrams and adaptations are given.

STEEL FORMS

Concrete Block Machine & Mold Co., 114 S. 2nd St., St. Louis, Mo.

254. Catalog No. 5 etc., this listing appears on page 70.

STONE, BUILDING

Art Stone Co., Waynesboro, Pa.

170. *Descriptive circulars with illustrations* of different marbles in colors. Sent free to any interested party.

STORE FRONTS

J. W. Coulson Co., Columbus, Ohio.

252. Store Front Construction simplifies the problem for the builder and owner. It beautifies and enhances the value of store property. A special device prevents glass breaking.

Detroit Show Case Co., 1660 W. Fort Street, Detroit, Mich.

Kawneer Co., Niles, Mich.

177. *Kawneer Store Front.* Illustrated catalog. Drawings and details of construction. Size 8½ x 11 in. 32 pp.

178. *Full Size Details Kawneer Construction.* Blue prints. Size 30 x 30 in.

179. *A Collection of Successful Designs.* Portfolio. Shows 24 typical store fronts with elevations. Size 9 x 12 in. 32 pp. Catalog B. J. B. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STRUCTURAL STEEL

National Pressed Steel Co., Massillon, Ohio.

STUCCO—See also Cement

American Materials Co., 101 Park Avenue, New York, N. Y.

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

182. *The Stucco House.* Contains many beautiful illustratioos of houses finished with stucco and selected particularly for their architectural value. Detailed illustrations of stucco surface textures and drawings showing wall construction with revised specifications covering application of stucco. 96 pp. 8½ x 11 in. Price 50 cents.

180. *Guide to Good Stucco.* A book telling of the advantages of Portland Cement stucco, and how to apply it. Shows numerous finishes obtainable with ATLAS WHITE Portlaod Cement. 28 pages. 8½ x 11 in.

National Kellastone Company, 155 East Superior Street, Chicago, Ill.

183. *Specifications for Stucco Work.* A booklet containing complete specifications in detail for the use of Kellastone stucco for new buildings as well as the "overcoating" of old buildings. 13 sheets of text, 2 sheets of illustrations. 8 x 11 in.

184. *The Story of Kellastone Imperishable Stucco.* In this most interesting book the merits of Kellastone are set forth in a convincing manner. Every page contains pictures of beautiful houses stuccoed with Kellastone, and there are two pages in color. 22 pp. Illustrated. 8½ x 12 in.

Rocbond Co., Van Wert, Ohio.

268. *"Fortifies Your Home Against the Elements and Time."* 16-page folder. 3½ x 6 in.

269. *"Better Homes."* 12-page booklet, 7¾ x 8 in., describing the advantages of "Rocbond."

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Avenue, Cincinnati, Ohio.

181. *Bishopric for All Time and Clime.* Catalog. 7½ x 11 in. 32 pp. Illustrated. Describing the use of Bishopric Stucco and Plaster Base and Bishopric Sheathing.

STUCCO-MAGNESITE—See Stucco

American Materials Company, 101 Park Avenue, New York, N. Y.; Weed Street and Sheffield Avenue, Chicago, Ill.

185. *Elastico, the Stucco of Permanent Beauty.* Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.

Natl. Kellastone Co., 155 East Superior St., Chicago, Ill.

United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

SURVEYORS' INSTRUMENTS—See Levels

SUSPENDED CEILING

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

186. *Loose-leaf Bulletins.* 8½ x 11. Jester-Saskett, consists of plaster board applied to metal channels with special clip, ready for plastering.

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SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 76*

THERMOSTATS—See Heating Equipment

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Building, Chicago, Ill.

187. *Handbook of Hollow Building Tile Construction.* 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.

National Fire Proofing Co., 250 Federal Street, Pittsburgh, Pa.

188. *Standard Wall Construction Bulletin* 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.

189. *Industrial Housing Bulletin* 172. 8½ x 11 in. Illustrated. Photographs and floor plans of typical workingmen's homes.

190. *Natco on the Farm.* 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.

TIMBER CLAMP

Schenk Timber Clamp Co., 501 Fifth Avenue, New York City.

TOOLS

C. E. Jennings & Co., 321 Winthrop Avenue, New Haven, Conn.
Mack & Co., Rochester, N. Y.
Progressive Mfg. Co., Torrington, Conn.
Sargent & Co., New Haven, Conn.
Stanley Works, New Britain, Conn.
James Swan & Co., Seymour, Conn.
The L. & I. J. White Co., Buffalo, N. Y.

TRACTORS

C. H. & E. Mfg. Co., Milwaukee, Wis.

275. Bulletin No. 4, Tractors.

TRAILERS

Rogers Bros. Co., Albion, Pa.

TRANSITS (See Levels)

Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.

TRUSS LOOPS

The Bostwick Steel Lath Co., Niles, Ohio.

235. *"Beautiful Permanent Walls,"* 22-page illustrated catalog. 4 x 9 inches.

VENTILATION

Royal Ventilator Company, 415 Locust Street, Philadelphia, Pa.

193. *Descriptive Catalog* of round and rectangular ventilators made in galvanized iron, copper, etc. Illustrated.

E. G. Washburne Co., 207 Fulton Street, New York, N. Y.

194. *Illustrated Booklet* of metal ventilators, weather vanes, lightning rods, etc.

WALL BOARDS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

195. *Descriptive catalog and sample of Linabestos Wall Board* for interior construction. Flame-proof and fire-resisting wall board.

Beaver Board Co., Buffalo, N. Y.

196. *Illustrated folder,* describing various uses and the methods of handling Beaver Board to the best advantage. Samples with descriptive literature sent on application.

Bishopric Mfg. Co., Cincinnati, Ohio.

198. Booklet, *"Bishopric for All Time and Clime."* Containing facts and figures, illustrated with photographs of beautiful houses built with Bishopric stucco, plaster and sheatbing units. Sent free.

Compo-Board Co., 5778 Lyndale Avenue, North, Minneapolis, Minn.

199. *Catalog sent on request with sample.* Describes many uses of Compo-Board.

MacAndrews & Forbes, 200 Fifth Avenue, New York, N. Y.

200. *Folder.* Describing uses and application of Fiberlic Wall Board, together with sample of same sent to any address.

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

201. *Walls of Worth.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Describes Sheetrock, the fireproof wall board, its advantages and uses.

Upson Company, Lockport, N. Y.

WALL FURRING

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

202. *Thirty-two-page Booklet.* 8½ x 11 in. Pyrobar. Tile.

WATER HEATER

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WATERPROOFING—See also Dampproofing

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

206. *Science and Practice of Integral Waterproofing.* Pocket size. 33 pp. Illustrated. Contains full specifications for waterproofing MASS Concrete, stucco and Cement Plaster Coat. Entire chapter devoted to "Practical Application of Waterproofed Cement Plaster Coat."

207. *Technical Pamphlet No.* 8. Booklet. 4 x 7 in. 28 pp. A discussion of why concrete requires waterproofing and the properties an integral waterproofing must possess to operate effectively with the natural properties of concrete.

WATER SUPPLY SYSTEM

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WEATHER STRIPS

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.

239. Six-page illustrated circular, describing the product as used for Hotels, Residences and Institutions.

Diamond Metal Weatherstrip Co., Columbus, Ohio.

242. 34-page illustrated catalog. 8½ x 11¼ in. Containing blue prints of the various styles and sizes of Weatherstrip.

Monarch Metal Products Co., 5020-26 Penrose Street, St. Louis, Mo.

210. *Cause and Effect.* A series of pamphlets describing Monarch Metal Weather Strips, which are made of bronze, brass and zinc. They differ from all other strips in that they are applied in spaces around doors and windows as elastic fillers and not over the space as covers. Each 4 pp. 8½ x 11 in.

WEATHER VANES

E. G. Washburne & Co., 207 Fulton Street, New York, N. Y.

211. *Descriptive Catalog in Colors.* Showing two different designs of weather vanes, lightning rods, ventilators, etc.

WINDOWS—See Also Doors and Windows

The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.

254. BOCA steel sash. (E-22.) A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.

Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.

Hope & Sons, Henry, 103 Park Avenue, New York.

212. *Catalog.* 12¼ x 8½ in. 30 pp. Illustrated. Full size details of outward and inward opening casements.

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254. BOCA steel sash. (E-22.) A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.

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The Bridgeport Chain Co., Bridgeport, Conn.

266. *Interesting catalog* describing Sash Chains, Hooks and Sash Chain Attachments.

Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.

The Kawneer Company, Niles, Mich.

213. *Kawneer Simplex Windows.* Catalog. 8½ x 10½ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installations in residences and buildings of all sorts.

214. *Detail Sheets and Installation Instructions.* Valuable for architects and builders.

Monarch Metal Products Co., 5020 Penrose Street, St. Louis, Mo.

232 16-page illustrated catalog, 4 x 9 in., on Window Casements.

National Mfg. Co., Sterling, Ill.

Pullman Mfg. Co., Rochester, N. Y.

Samson Cordage Works, Boston, Mass.

Catalog. 3½ x 6¼ in. 24 pp. Illustrated. Covers complete line.

Sargent & Co., New Haven, Conn.

Stanley Works, New Britain, Conn.

WOODWORKING MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.

217. *Contractors' Bulletin No. 77.* Describing various types of portable Variety Woodworkers. General catalog No. 22, describing a general line of woodworking machinery.

W. F. & John Barnes Co., 71 Rudy Street, Rockford, Ill.

218. *Catalog.* Containing description of rip and other machine saws, formers, mortises, tenoners, lathes. 38 pp. Illustrated.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.

219. *Catalog* of portable saw rigs, pumps, compressors, engines, etc. 48 pp. Illustrated.

The Crescent Machine Co., 259 Main Street, Leetonia, Ohio.

220. *Catalog.* Describing band saws, shapers, jointers, planers, borers, mortises, etc. 144 pp. Pocket size. Illustrated.

R. E. Kidder Co., 35 Hermon Street, Worcester, Mass.

222. Catalog. Describing improved boring machine and how it can be used.

Parks' Ball Bearing Machine Co., Sta. "A," Cincinnati, Ohio.

223. *Illustrated Folder.* Describing Parks' Planing Mill Special, comprising circular saw, jointer, band saw, shaper, borer, tenoner, etc.

J. D. Wallace & Co., 1401 Jackson Boulevard, Chicago, Ill.

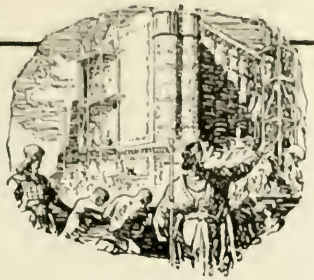
225. *Bulletin No.* 219-K. Describes portable electric punch machines, tools, planers, jointers, circular saw, etc.

Woodworkers Mfg. Co., 614 Bush Street, Detroit, Mich.

263. 18-*page illustrated pamphlet,* 10¾ x 7¾ in., called "The Master Woodworker." The Model No. 7 machine is described in detail.

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This extraordinary strength, accompanied by a flexibility unequaled by any other plastic material, combine to make Kellastone products of real worth in the field of architecture and construction. Kellastone also ranks very high in resistance to fire.

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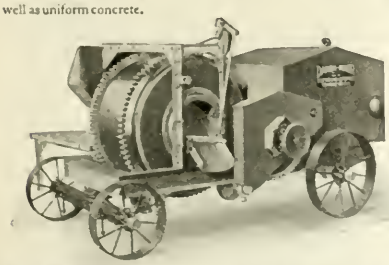
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4 and 7 cubic feet mixed concrete. Steam and Gasoline. Power charging skip or low charging platform — automatic water-measuring tank. Discharge control from both sides. May be equipped with light duty hoist. Mixes mortar as well as uniform concrete.

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Get the Dandie Catalog D-4

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It takes 10 seconds to load a Jaeger; 45 seconds for the batch to mix; 5 seconds to discharge it—*a complete batch in a third to a half the time it takes with any non-tilting type mixer.*

Consider a day's output at that rate and you'll agree that *it costs less to mix concrete in a Jaeger* than in any other mixer on the market. And that means *more dollars in your pocket.*

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BUILDING AGE

AND

THE BUILDERS' JOURNAL

NEW YORK, AUGUST, 1922



Adaptation *of* Seventeenth Century New England Colonial Style *to* Modern Home

DWIGHT JAMES BAUM, Architect

HOUSE building in America was slow to attain definite architectural style, but towards the end of the seventeenth century considerable progress was made in developing a style and construction that met with conditions the earlier settlers had to face.

As New England was largely settled by people who came from England it is only natural that the carpenters, etc., of that time brought with them the sturdy building ideas of old England. The rigors of the New England winters made adequate heat essential, therefore important features were the huge fireplaces and chimneys.

Quite often the second floor was framed to overhang the first, and to make this an ornamental feature the overhangs were generally embellished by carved "drops."

A house constructed in this style located at Salem, Mass., has been made famous by Nathaniel Hawthorne's book, "The House of the Seven Gables."

Quite a few interesting examples of the old New England builder's handicraft are still in existence in some parts of Massachusetts and Connecticut, even though they were built over 200 years ago.

In the design shown on our cover and pictured above, and of which floor plans are given on the next page, the architect has faithfully carried out the old New England traditions and adapted this style in the building of a modern home. This house was built at Fieldston, N. Y., for Miss Ellen Murphy.

Several features are included in this modern design that would certainly surprise our old New England ancestors could they visit us today.

IN a recent interview Mr. Dwight James Baum, prominent New York architect, disclosed many interesting developments in electrical installations.

Particular attention was paid to the wiring of the Murphy house, shown here, of which Mr. Baum was the architect. Outlets have been provided in all rooms for attaching table lamps, floor lamps, torchiers and wall brackets."

"How about sconce over the mantlepiece?"

"I do not favor them. I prefer to wire the mantlepiece so that candlesticks may be used—they are more decorative."

"How about centre floor outlets?"

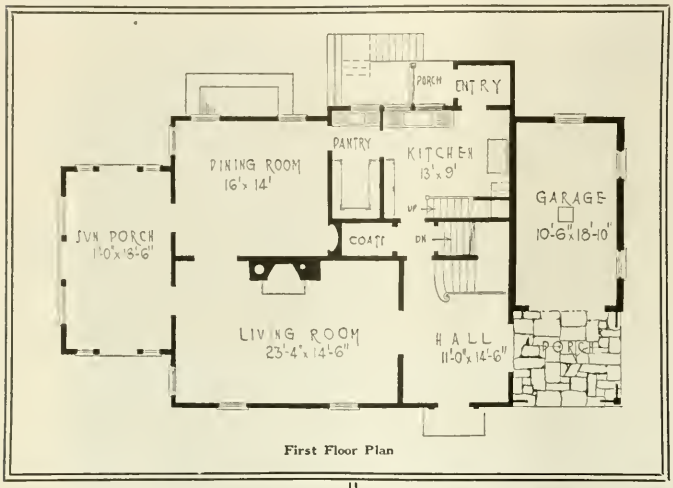
"Always in dining room and living room. Two in the dining room—one for call bell and one to permit the use of electric appliances. There must be a centre floor outlet in the living room to permit the use of table lamps."

"Don't people object to having holes cut in rugs?"

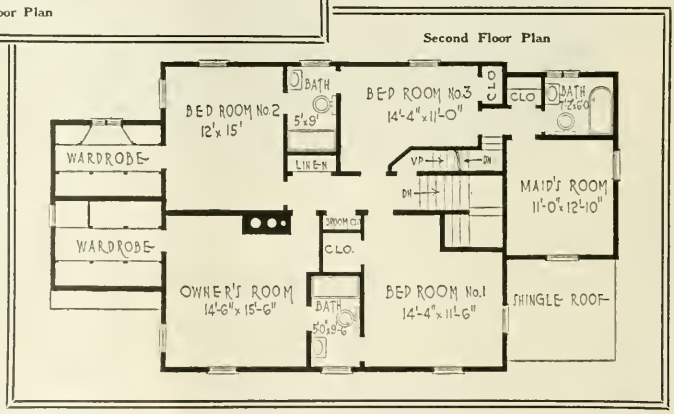
"Not if it is done properly—we never have any trouble about it."

"Has there been any marked change in the kind of equipment installed?"

"Yes, there has," he replied, "the transformer is always used now instead of batteries as this eliminates the nuisance and inconvenience of recharging. Electrical refrigeration is installed in nearly all modern homes and we are equipping all our houses



First Floor Plan



Second Floor Plan

the modern electrical appliances that mean so much for comfort.

Mr. Baum was also the architect of the "Ideal" home illustrated in our April issue, which was built at the recent "Own Your Home" exhibition in New York City; and in conversation with Miss Alice Carroll, of the Society of Electrical Development, stated:

"I recommend separate circuits for light and power whenever possible and I insist that all wiring be laid underground. The most imposing residence is more or less disfigured if lines of wires extend to and from the roof."

"Have there been any marked changes in building methods within the past few years?" Mr. Baum was asked.

"There is a decided leaning toward the 'homey' type house and a distinct aversion to the mansion or 'show place.'"

"How has this affected wiring installations?"

"Centre ceiling illumination, except in the dining room and the hall, is falling into disuse. The popular 'homey' type of house calls for lower ceilings and lower ceilings are more effectively lighted from side wall brackets."

"How do you account for this tendency?"

"It has taken a great deal of educational effort on the part of the architect to bring it about," explained Mr. Baum. "People have lived in apartments so long that when they go to build a house they think they must have 10′ ceilings and at the same time they want a cozy, homey atmosphere. An 8′ 6″ or even a 7′ 6″ ceiling does more to create this homey atmosphere than any other factor of design."

"What lighting installation do you recommend?"

"More and more baseboard outlets—portable lamps everywhere—now for radio. Every house we build is supplied with baseboard outlets for laundry and other labor saving equipment."

"What percentage of building cost do you usually figure for wiring and lighting?"

"At least five percent," he replied, "but the present demand for radio equipment as well as refrigeration and special burglar alarm systems increases this percentage materially."



Brick Home *of* Attractive Design

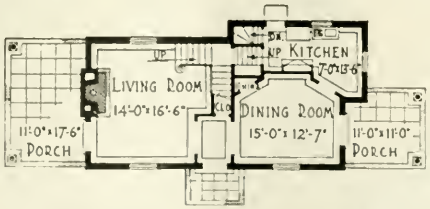
PLEASING in appearance is the small house pictured above. The design has been modeled after some of the older brick Colonial houses of Pennsylvania.

The rooms have been arranged so that everything is compact, and while there is no waste space, there is no crowding. The two bedrooms on the second floor are of fair size and an additional servant's room and storage space are obtained in the attic.

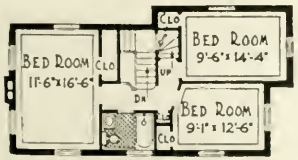
To obtain a low effect to the house which is so desirable with this type of architecture, the ground has been terraced along the front and beyond the side porches, but it does not extend to the rear allowing plenty of light to enter the cellar.

This interesting house is built at Narbeth, Pa., and the architects let out the work to different individual contractors; no general contractor was employed on the job, as the architects attended to the supervision and co-ordinated the work of the different contractors so that no difficulty was experienced in the construction of this house.

Brick lends itself charmingly to a house of this design. The trim, shutters, columns, etc., are all painted white as this contrasts with the dark red brick surface of the walls. The dormers were also painted white, and, the roof being of green, this combination of color produced a very striking appearance.



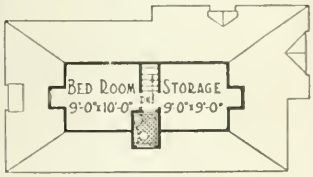
First Floor Plan



Second Floor Plan

WALLACE & WARNER

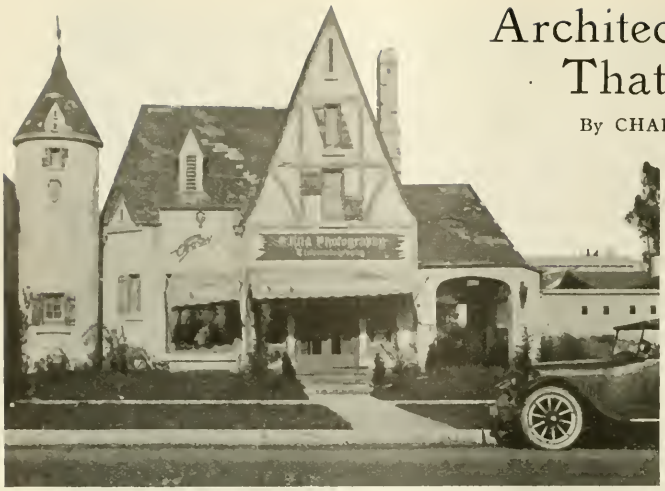
Architects



Third Floor Plan

Architectural Designs That Advertise

By CHARLES ALMA BYERS



MAKING one's place of business, through its style of architecture, serve as an advertisement in itself constitutes an idea that is far from new. However that may be, it at least seems to be, at present, coming in for quite unprecedented development. Architecture, in shops, business offices, "studios," and so forth, that will attract and hold the attention of passersby, and thereby help to advertise such places, is, in fact—especially for those semi-business districts lying within or close to residential sections—becoming very popular, indeed.

The accompanying illustrations show three particularly interesting examples of such architecture, all from Los Angeles, California.

The first building here illustrated is the studio of a portrait photographer. The interior is partitioned into reception room, business office, exhibit room, various work rooms, and so forth, and, like the exterior, is also finished in rather striking style, with a fine, large fireplace in the reception room. It was designed by Charles D. Wagner, architect, of Los Angeles.

The second illustration is of a building that is likewise somewhat representative of an old home of Northern Europe. Its outside walls are of cement-stucco over frame construction, and are tinted, with mottling effect, in brown, buff and gray, while the wood trimming is done in dark brown. The roof is of wood shingles so laid as to produce a thatched effect, and, to carry this suggestion to greater effectiveness, is painted a weathered straw color.

It should also be noticed that the ground in front is paved with cobblestones. Only the division to the right, in this instance, is used for business purposes, it being the office and studio of E. Petersen, interior decorator. The other portion, planned with much greater depth, is devoted to living rooms.

The lower illustration shows an attractive little flower shop, with an architect's studio adjoining it to the right and rear. The building was expressly designed and built for the present occupants. It is of a modification of English architecture. The former is occupied by A. E. Hanson's "Kew Gardens," and the latter by H. F. Withey, the building's designer and builder.





It is easily understood that shops and offices of the kind shown in these illustrations will be sure of attracting unusual attention, and that, of course, means advertising—and advertising brings business.



Type of well-kept, but old-fashioned, farm it will pay to modernize

ENCOURAGING FARM BUILDING

Profitable Field of Work Developing for Builders in the East by Formation of a Joint Stock Land Bank in New York Liberal Financial Aid for Improvements

FINANCING a desirable building improvement on farm property has been rather a hard thing to do at reasonable cost. In our Eastern States which built up earliest there is a lack of modern farm buildings and equipment. In the West, farm buildings and their equipment are more modern.

There are many farms in the East that are in poor shape, the ground is poor for lack of fertilizer, and the building and equipment are old, but their proximity to the large buying market makes their location ideal for carrying on a profitable farm business. The money to finance necessary new construction, etc., has been hard to obtain at a profitable rate, so the farmer was handicapped with old equipment and it was hard to compete with those having modern farm equipment.

Many young men have been left large farms by their fathers who worked it profitably for more than a generation. The son inherits it, but is handicapped by being unable to meet modern competition as he must depend on hand labor and his old equipment. This situation in the East has resulted in many abandoned farms as the owners have found it unprofitable to continue in business. Now this condition of affairs can be remedied to a large extent, within the next few years, as through the agency of a farm loan bank, the money for making the necessary improvements can be had on very favorable terms (33 years to repay loan) so that it will pay to modernize these old farms.

Some few years ago, Congress passed the Federal Farm Loan Act, but like all good things it takes a seemingly long while to get in operation. A bank under this act has just been formed in New York and it is



Farm buildings of the future will combine beauty with utility

now ready to do business. This is known as the First Joint Stock Land Bank of New York with offices at No. 61 Broadway, New York. By their charter, they are limited to make loans in the States of New York and Pennsylvania only, but it will not be long before a number of these banks will be established to cover all the Eastern States.

Study Farm Buildings

BUILDERS will do well to post themselves on the construction and equipment of modern farm buildings, as many a profitable contract may be obtained. Farm improvements during the next decade will mean Big Business for alert, progressive builders, especially in the East.

The building contractor will get in touch with a wide-awake farmer and suggest to him for instance, that a good large dairy barn would perhaps be a very profitable business undertaking for Mr. Farmer. Mr. Builder will know how the money can be obtained by Mr. Farmer, to make the desired improvement and make it pay for itself out of the profits earned by reason of his new equipment and increased facilities.

As we have repeatedly advised our readers, we think that they should be able to advise their customers how to finance some worthwhile improvement thereby obtaining a desirable contract for themselves. This is the right kind of salesmanship and the wide-awake contractor who does this is the one who will get the business.

A Joint Stock Land Bank operates under a charter granted by the United States Treasury Department, through the Federal Farm Loan Board, which directly supervises the operations.

The Federal Farm Loan Act was passed to provide capital for agricultural development, to create standard forms of investments based upon farm mortgages, to equalize rates of interest on farm loans, to furnish a market for United States bonds, to create government depositories and financial agents for the United States. These banks are by law, allowed to make loans on agricultural land only in the state in which they are located and one adjoining state.

Loans are made only where money will be used for agricultural purposes. This means not only for the improvement of the soil itself, but also for buying of cattle, for purchase of equipment, and for erection of new farm buildings or dwellings, to provide working capital for the operation of the farm, as well as to pay existing debts. To obtain a loan is a simple matter. An application blank is to be filled out by the party desiring to make a loan. This is to be properly filled out with a description and location of the property and for what purpose the money secured from the loan is intended. A statement of the valuation of the property is to be made and then, within a few days, the property will be appraised by a government appraiser, and the report is made on the title by a government title inspector. If everything is found satisfactory, the loan can be closed at once.

Cost of Loan

THE loan is made at the rate of 6% annually, and by the addition of a small annual payment of $10 for each $1,000 borrowed, in addition to the interest, the whole loan is paid for in thirty-three years. In other words, a building loan may be secured which will pay for itself or "amortize" in thirty-three years by a payment of 1% annually on the principal. As an illustration, take a loan for $10,000. This would require an annual payment of $700, payable $350 semi-anually. $600 of this amount goes annually for interest and $100 annually goes towards wiping out the loan.

Unless one has calculated it out, it does not seem possible that 1% annually will be able to pay the full debt in thirty-three years, but it is shown that $50 deposited semi-annually at 6% compound interest, will amount to $10,000 in a little less than thirty-three years. In actual cash, the depositor would have only paid in $3,300, but the compound interest in that time will amount to $6,700.

This is the plan on which these loans are made and paid. It is no charitable scheme of the government, but just simply good, practical, hard common sense, based on sound financial experience. The borrower does not get something for nothing. He pays at the rate of $70 per year for each $1,000 borrowed from which is deducted the regular 6% interest and the 1% balance is applied on his debt.

Builders can impress their farmer customers with the advantage of this system to make some needed improvements. Unlike an ordinary mortgage that falls due in a certain time in one lump sum, this farm act of the government enables a mortgage to be paid off in small instalments over what practically amounts to a generation. Should the farmer by reason of his increased income, feel like paying off the loan before its maturity, he has that privilege after five years.

After the loans are made, the Land Bank deposits the mortgages on which they have loaned with the government registrar who is the direct representative of the United States Treasury. He in turn forwards them to the Farm Loan Board at Washington, D. C., for their approval. When they have approved of this mortgage, Joint Stock Land Bank bonds are issued to the bank and they sell these to obtain money to make other loans. In this way, by government aid, the money is kept constantly in circulation and adequate sums can be realized for the furtherance of any worthy farm project.

Cost of Appraisal

THE borrower furnishes, with his application, an abstract of title to the farm and pays the expense of appraising and examination of his title by the Federal Appraiser. This appraisal and title examination cost will not exceed the actual expense of making same. The cost will vary from $15 to $25. Loans are made for an amount totaling 50% of the land value plus 20% of the value of the buildings.

As an illustration of the above, take a farm of 100 acres that is valued at $200 per acre, with buildings worth $8,000. The farmer in consultation with the progressive builder desires to erect a modern dairy barn as he knows he will be able to make more money this way, but he lacks the money to go ahead. The new barn will cost $6,500, therefore, the owner can secure the following loan on his property:

50% of $10,000, the value of the land, equals $5,000.

20% on the existing buildings valued at $8,000 equals $1,600.

20% of the new barn valuation of $6,500 equals $1,300.

This totals to $7,900, which can be secured on a loan.

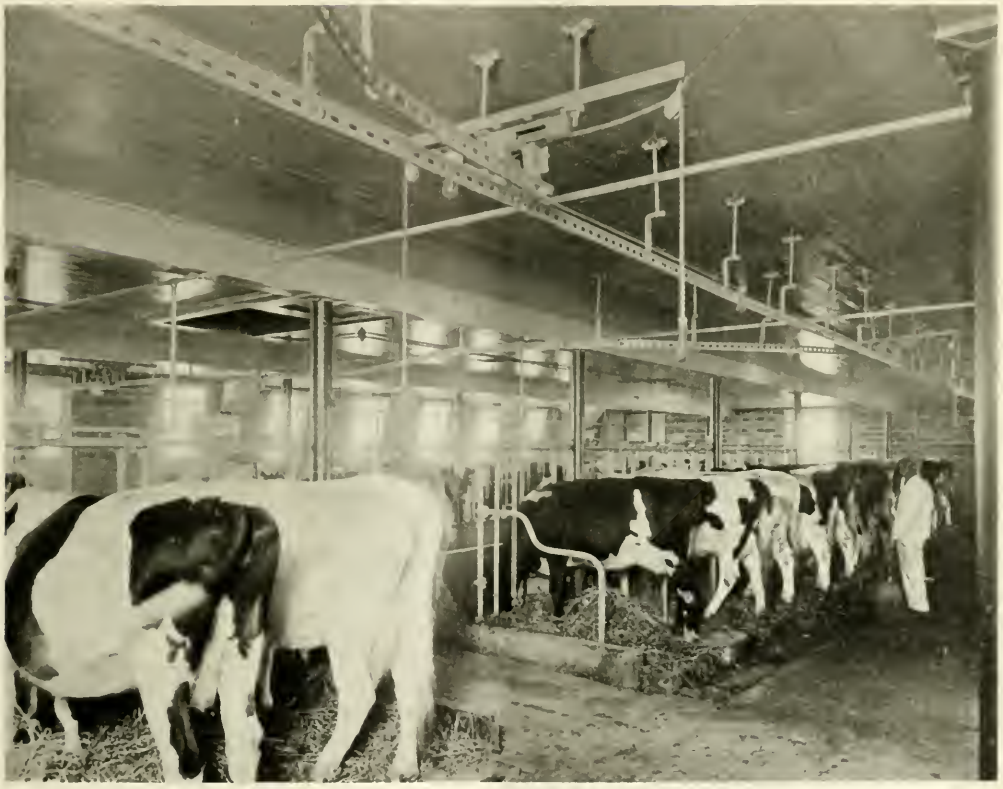
If the maximum amount of loan is desired, the extra money so secured above the cost of the contemplated improvement can be used for the purchase of extra stock, etc.

It is not only in the construction of large barns that the builder will find a profitable line of work, but there is an immense amount of building such as tool sheds, ice houses, garages, milk house, chicken house, hog house, granery, corn cribs, etc., that are required on the up-to-date farm.

Builders should inform themselves regarding the construction of all these different sorts of buildings. They should have a collection of reliable plans of farm buildings, as suggestions for the farmer who wants to improve his place. It is not only in the erection of the farm buildings themselves, that the contractor can make a profit, as there is the equipment, water system, electric light plant, anything that will lighten the work of the farmer or his household.

Today, farming is again becoming a very popular form of employment. The day of the awful lonesomeness and weariness has passed. We are now living in the age of the telephone, wireless, moving pictures, aeroplane, good roads, automobiles, etc. Farms are no longer isolated; modern inventions have cut down the time it takes to go from one place to another. Years ago it was a hardship to hitch up a horse and buggy for a five-mile ride; today the farmer thinks nothing of going twenty-five miles away to visit some folks. Farm buildings of the future will be good to look at, the farmer will take pride in his possessions and his wife and family will have a home with all modern conveniences. Attention will be given to landscaping; entrance gates, fences, etc., will be objects of beauty instead of eyesores. The farmer of the future is going to dwell in a veritable park surrounded by everything that will give him comfort and pleasure.

Any builder interested in this matter can write to the Federal Farm Loan Bureau, Treasury Dept., Washington, D. C., for circulars on the subject. They will then be equipped with information that will enable them to go to their farmer friends and talk on the basis of dollars and cents. The building boom that is now existing for the construction of residences will in time recede to normal and it is then that the builder who knows where to go for business is going to get it. The farms hold out the horn of plenty.



The kind of construction and equipment needed in our modern dairy barns

Hotel *of* Modern Design



EVERY city has the need of several hotels for the accommodation of its transient population. In a great many instances, hotel life appeals to permanent residents desiring to be free from all care and worry of housekeeping, still they desire absolute comfort. A hotel can give it to them by having living room with one or more bedrooms in a suite.

The design shown here is that of the Hotel Prisament that is now nearing completion at Broadway, Amsterdam Avenue and 74th Street, New York. The general contractors on the job are J. G. Siegel, Inc.

In appearance, the building will be worthy of the conspicuous position it occupies. The facades of the building are designed with 3½ stories of limestone. Above this, a tapestry red brick with terra cotta belt course and balconies.

The main entrance of the hotel is situated on the 74th Street side; this carries a suggestion of the Italian style of architecture in its detail.

The street floor will be given over to main restaurant, lobby, office, ladies' rest room, physician's office, etc.

The main lobby is being finished with wood paneling after the style of the old English Manor House. The restaurant will have a 350-seating capacity.

Above this main floor there are fourteen floors divided into guest rooms. The plan on the opposite page shows how this division has been carried out.

In the planning, particular care has been taken so that a number of rooms can be joined together for the use of permanent guests.

There will be approximately 340 rooms in the hotel. Each floor will contain fifteen baths. Circulating ice water will be supplied each room.

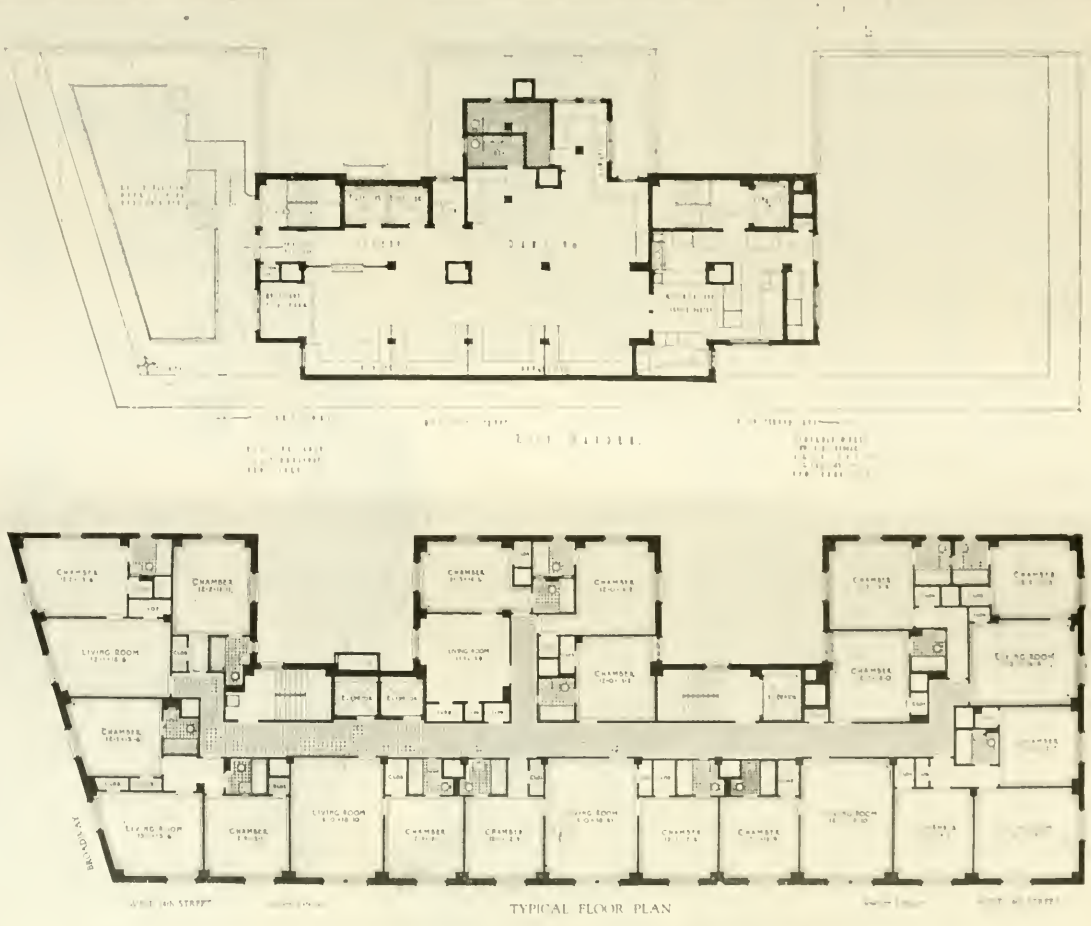
SUGARMAN & HESS,
Architects

WM. E. BLOODGOOD,
Associate Architect

Every appliance and feature that could be thought of to add to the comfort and safety of the guests has been included in this modern hostelery.

A popular feature will be a glass enclosed roof garden with dance floor and sun parlor located on the roof. This can be used both summer and winter.

There will be a restaurant surrounding the dance floor. The garden will be more than 160 feet above the street level and a wonderful panorama view can be had by the guests as the beautiful Hudson River is within a short distance.



Floor Plans of the new Hotel Prisament, New York

Substantial House with Garage Attached

Hollow Tile Design Specially Prepared for Readers of Building Age and The Builders' Journal

By R. C. HUNTER & BRO., Architects

FOR those who like a plain, substantial house, something with a suggestion of dignity and permanence, here is one that will appeal.

The house is designed to be built of hollow tile with stucco finish. The hipped roof with broad overhanging eaves gives good appearence.

The group windows with their flower boxes and the well designed entrance lend interest to the exterior and offers a pleasing contrast with the plain stucco walls.

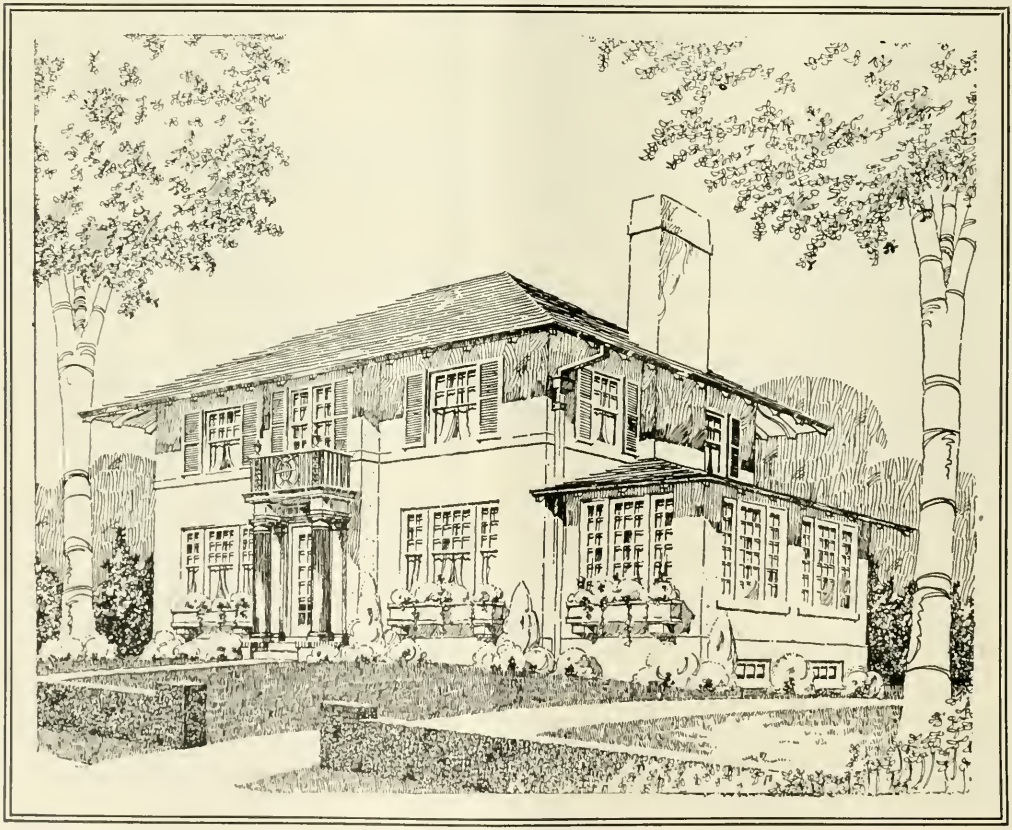
A feature of this house is the garage which is placed under the living porch. A concrete incline leads down from the grade in the rear to the garage floor which is at the same level as the cellar floor. A fireproof door connects the garage with the cellar, thus making the car accessible without going out of doors.

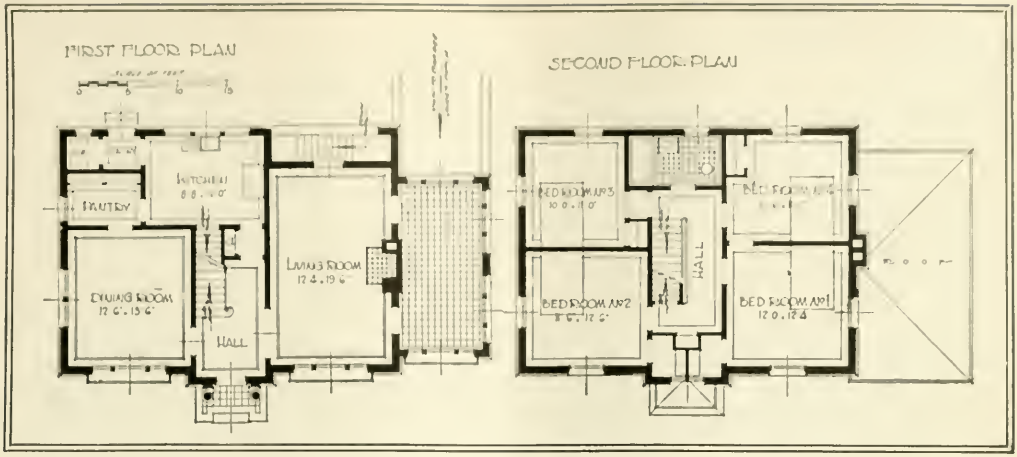
The garage has complete water, lighting and sewer service, all connected to the house supplies at a very slight cost.

The reinforced concrete floor of the living porch forms a fireproof roof for the garage. In the living porch a quarry tile floor is laid over the concrete. The living porch has been made another room by completely enclosing the openings with sash and screens, and a room that proves to be the most popular one.

The living room, dining room, kitchen and pantry are all well arranged. On the second floor are four corner bed rooms, bath room and linen closet.

A stairway leads to the attic where good storage space is provided. The laundry and other utility rooms are in the cellar. Estimated cost about $9,500.





Quantity Survey of the Substantial House

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc. Minor outs have been disregarded.

Such items as clearing site, temporary work and protections, scaffolds and general equipment and supplies, have not been included. Items marked "Unit" are to be estimated in a lump sum, following requirements of plans and specifications.

Excavation

(Excavation for pipe trenches not included)

Excavation for cellar	308	cu. yds.
Excavation for footings	27	cu. yds.
Excavation for areas and runway	48	cu. yds.
Backfilling around walls, etc.	44	cu. yds.

Masonry

CONCRETE WORK

Concrete for Cellar Walls	990	cu. ft.
Concrete for footings	144	cu. ft.
Concrete for area walls	50	cu. ft.
Cellar floor and runway (3 in. concrete and 1 in. cement finish)	1130	sq. ft.
Area Bottoms (brick and sand)	32	sq. ft.
Outside cellar steps (concrete cement faced)	42	sq. ft.
Ent. Porch floor (12 in. cinders, 3 in. conc. and brick finish)	40	sq. ft.
Rear Steps (con. cement faced)	24	sq. ft.
Reinf. Conc. runway walls	201	cu. ft.
Reinf. Conc. Living Porch Floor.. (4 in. T. C. tile, 2 in. conc. top, 4 in. joist)	180	sq. ft.
Reinf. Conc. lintels	102	cu. ft.
Concrete brackets for Flower Boxes	6	
Concrete forms	3300	sq. ft.
Pointing Cellar window sills	22	lin. ft.

Tile Work

Tile work for bath room		
Floor (1 in. hex. white)	35	sq. ft.
Wainscot 3 in. x 6 in. white wall tile	92	sq. ft.
6 in. base	16	lin. ft.
Cap	26	lin. ft.
Quarry tile floor for living porch	140	sq. ft.
4 in. base	45	lin. ft.

Hollow Tile

8 in. x 12 in. x 12 in. block (or 1550 blocks)	1550	sq. ft.
10 in. x 12 in. x 12 in block	130	blocks.
4 in. x 12 in. x 12 in. block for corners	80	blocks.
8 in. jamb blocks	220	
1 in. leveling slab	80	

Brick Work

Common brickwork for chimney (or 2 M.)	100	cu. ft.
Face brick for fireplace hearth and jambs (or 112 brick)	16	sq. ft.
Face brick for fireplace	20	sq. ft.
8 in. x 12 in. T. C. flue lining	56	lin. ft.

Mason's Iron Work

Fireplace damper (2 ft., 8 in. opg., with throat, etc.)	1	Unit.
C. I. cleanout door for boiler flue, (8 in. x 8 in.)	1	Unit.
Thimble for boiler flue (10 in. dia.)	1	Unit.
Anchor bolts for wall plate, (3/4 in. dia. x 24 in. long with 4 in. washer and nut)	38	
Wrought iron pipe railing, 2 ft. 6 in. high (1 rail 1 1/2 in. dia.)	51	lin. ft.
Wrought iron pipe railing, 2 ft. 6 in. high (2 rails, 1 1/2 in. dia. on steps)	7	lin. ft.

Plastering

Three coat Patent plaster on metal lath, gross (Net 407 sq. yds.)	490	sq. yds.
Three coat patent plaster on hollow tile, gross (Net 168 sq. yds.)	245	sq. yds.
Dampproofing under stucco, net	2500	sq. ft.
Stucco on hollow tile, etc, gross (Net 260 sq. yds.)	325	sq. yds.
Stucco on metal lath	7	sq. yds.
G. I. corner beads	80	lin. ft.

Sheet Metal Work

Tin flashings for roofs, etc	46	lin. ft.
Tin flashing and counterflashing for chimney, etc	10	lin. ft.
Chimney cricket	5	sq. ft.
Tin roof on entrance porch	24	sq. ft.
Tin roof on dormer	54	sq. ft.
Flashing for column caps	2	caps
4 in. moulded G. I. hanging gutter	146	lin. ft.
3 in. moulded G. I. hanging gutter	45	lin. ft.
3 in. x 4 in. galv. iron leaders	82	lin. ft.
Bends for same	15	
Gutter thimbles	6	
3 in. dia. tin leaders	4	lin. ft.
Bends for same	2	
Gutter thimbles	1	
3 in. x 4 in. G. I. gas range vent	22	lin. ft.
Cap and thimble for same	1	

Carpentry

TIMBER

All No. 1 stock, hemlock, rough unless noted.

Cellar girders—		
2 in. x 3 in nailer—100 lin. ft.	50	F. B. M.
6 in. x 10 in. spruce—1/10, 1/8	90	F. B. M.
3 in. x 10 in. spruce—1/12, 2/10, 4/8	160	F. B. M.
Wall plates—		
3 in. x 8 in—3/14, 7/12, 4/10	332	F. B. M.
Studs, girts and plates, 1st floor—		
2 in. x 4 in.—76/8	405	F. B. M.
Studs, etc., 2nd floor, 2 in. x 4 in. 116/8	618	F. B. M.
1st floor joists—		
2 in. x 10 in.—4/16, 32/14, 6/12	1034	F. B. M.
2nd floor joists—		
2 in. x 8 in. spruce—32/14, 9/16	789	F. B. M.
3rd floor joists—		
2 in. x 6 in.—36/14, 18/8	592	F. B. M.
Rafters—		
2 in. x 6 in.—39/14	545	F. B. M.
Hips and ridge—		
2 in. x 8 in.—4/20, 1/10	120	F. B. M.
Living porch rafters—		
2 in. x 6 in.—11/12	132	F. B. M.
2 in. x 8 in.—2/18	48	F. B. M.
Ceiling beams—		
2 in. x 4 in.—14/10	94	F. B. M.
Ent. porch rafters, etc.—		
2 in. x 4 in.—4/10	27	F. B. M.
Collar beams—		
2 in. x 4 in.—10/10	67	F. B. M.
Floor bridging—		
2 in. x 3 in.—350 lin. ft.	175	F. B. M.
Cellar partitions—		
2 in. x 4 in.—10/14, 18/10	213	F. B. M.
Sheathing (7/8 in. x 8 in. shiplap)		
Walls and flat roofs to cover	95	sq. ft.
Sheathing paper (waterproof)	25	sq. ft.
Shingle lath— (7/8 in. x 3 in.)	3800	lin. ft.
Grounds (3/4 in. x 2 in., surfaced one side)	2200	lin. ft.
Sheathing for cellar partitions (7/8 in. x 8 in. shiplap) to cover	480	sq. ft.
Rough flooring, (7/8 in. x 8 shiplap)		
1st and 2nd floor, to cover	1428	sq. ft.
Furring (7/8 in. x 2 in.)	400	lin. ft.
Shingle roofs (18 in. stained shingles)		
17.3 squares	1300	shingles

Exterior Finish

Main cornice—		
Show rafters 3 in. x 8 in. x 5 ft. 0 in. long	66	
Show rafter hips—7 ft. 0 in. long	4	
7/8 in. x 8 in. fascia	280	lin. ft.
3/4 in. x 4 in. M. & B. ceiling to cover	410	sq. ft.
Living porch cornice—		
Show rafters 3 in. x 8 in. x 3 ft. 6 in. long	20	
Show rafter hips—5 ft. 0 in. long	3	
7/8 in. x 8 in. fascia	90	lin. ft.
3/4 in. x 4 in. M. & B. ceiling to cover	95	sq. ft.
Dormer cornice—		
4 in. crown mould	21	lin. ft.
7/8 in. x 4 in. fascia	21	lin. ft.
7/8 in. x 6 in. soffit	21	lin. ft.
8 in. bed mould	21	lin. ft.
Flower boxes—		
(1 1/8 in. wood boxes lined with zinc)		
12 in. x 12 in. x 9 ft. 0 in. long	2	Units
12 in. x 12 in. x 7 ft. 6 in. long	1	Unit
Entrance porch—		
10 in. dia. turned cols. fluted, 7 ft. 10 in. long, with cap and base	2	
10 in. pilasters 7 ft. 10 in. long, with cap and base	2	
5 in. crown mould	15	lin. ft.
7/8 in. x 4 in. fascia	15	lin. ft.
7/8 in. x 8 in. soffit	15	lin. ft.
1 1/2 in. bed mould	15	lin. ft.
7/8 in. x 8 in. frieze	20	lin. ft.
1 1/8 in. x 6 in. frieze, moulded	12	lin. ft.
1 1/4 in. neck mould	12	lin. ft.
7/8 in. x 10 in. soffit	7	lin. ft.
Paneled ceiling, 1 ft. 6 in. x 4 ft. 6 in., with compo. ornaments	1	
Frieze ornaments, etc	1	Unit
Wood balustrades, 2 ft. 8 in. high with newel rails, etc	13	lin. ft.
Lattice panel 4 ft. 6 in. x 10 ft. 10 in.	1	
Windows—		
Frames complete with sash, outside trim, etc. Sash 1 1/2 in. thick, glazed D. T. (masonry wall)		
Cellar windows—		
Single top hung sash, casem. 3 ft. 0 in. x 2 ft. 0 in.		
4 light	4	
Same with wire screen in place of sash	1	
Mull. D. H. sash ea. 2 ft. 6 in. x 3 ft. 0 in.	1	
8 light		
First floor windows—		
Triplet D. H. sash, side ea. 1 ft. 8 in. x 5 ft. 6 in., center 3 ft. 0 in. 5 ft. 6 in.	2	
Triplet casem. sash, side ea. 1 ft. 6 in. x 5 ft. 6 in., center 2 ft. 6 in. x 5 ft. 6 in.	2	
Triplet casem. sash, ea. 1 ft. 8 in. x 5 ft. 6 in	2	
Single D. H. sash 3 ft. 0 in. x 4 ft. 10 in.	1	
Triplet D. H. sash, ea. 2 ft. 6 in. x 3 ft. 0 in.	1	
Single casem. sash, 1 ft. 8 in. x 2 ft. 0 in.	1	
Single D. H. sash, 2 ft. 6 in. x 3 ft. 0 in.	1	
Mull. D. H. sash ea. 2 ft. 6 in x 3 ft. 0 in.	1	
Second floor windows—		
Single D. H. sash 3 ft. 8 in. x 4 ft. 4 in.	2	
Single D. H. sash, 3 ft. 0 in. x 4 ft. 4 in.	6	
Single D. H. sash, 2 ft. 6 in. x 3 ft. 0 in.	1	
Mull. casem. sash, ea. 1 ft. 8 in. x 4 ft. 4 in.	1	
Attic window—		
Mull. casem. sash, ea. 2 ft. 6 in. x 1 ft. 8 in. (frame)	1	
Blinds—(1 1/8 thick, movable louvres)		
3 ft. 8 in. x 4 ft. 5 in. pr	2	pr.
3 ft. 4 in. x 4 ft. 5 in. pr	1	pr.
3 ft. 0 in. x 4 ft 5 in. pr	6	pr.
2 ft. 6 in. x 3 ft. 1 in. pr	1	pr.

Exterior door frames (1 3/4 in. thick rabbeted), complete with outside trim.		
Frame for front ent. door, 3 ft. 2 in. x 7 ft. 0 in.	1	
Frame for rear ent. door, 2 ft. 6 in. x 6 ft. 10 in.	1	
Frame for cellar ent. door, 2 ft. 6 in. x 6 ft. 0 in.	1	
Frame for garage ent. door, 8 ft. 0 in. x 7 ft. 10 in.	1	
Frame for doors to living porch, 2 ft. 8 in. x 6 ft. 10 in.	2	
Exterior doors—(all to detail)—		
Front ent. door, 3 ft. 2 in. x 7 ft. 0 in. x 1 3/4 in., glazed	1	
Rear ent. door, 2 ft. 6 in. x 6 ft. 10 in. x 1 3/4 in., glazed	1	
Cellar ent. door, 2 ft. 6 in. x 6 ft. 0 in. x 1 1/2 in., glazed	1	
Garage ent. door, pr. ea. 4 ft. 0 in. x 7 ft. 10 in. x 2 1/4 in., glazed	1	
Doors to living porch, 2 ft. 8 in. x 6 ft. 10 in. x 1 3/4 in., glazed	2	
Finished flooring—		
Living room, dining room, ent. hall, plain sawed white oak, 13/16 in. x 2 1/4 in., to cover	487	sq. ft.
Kitchen, pantry, etc., No. 1 maple 13/16 in. x 2 1/4 in., to cover	170	sq. ft.
Second story, No. 1 comb grain Y. P., 7/8 in. x 2 1/4 in., to cover	620	sq. ft.
Lining paper under floors	1500	sq. ft.
Slat floor under laundry tubs, 3 ft. 0 in. x 4 ft. 0 in.	1	Unit
Joist hangers, (1 1/4 in. x 2 in. W. L.)—		
For 2 in. x 10 in. beams	5	
For 4 in. x 10 in. beams	4	
For 2 in. x 8 in. beams	4	
For 4 in. x 8 in. beams	4	
Beam anchors, 3/8 in. x 1 1/2 in. x 18 in.	35	
Cement filled pipe cols. in cellar, 4 in. dia. x 7 ft. 6 in. long, with caps and bases	6	

Interior Finish

(Whitewood unless noted)

Door trim—		
7/8 in. jambs, 1/2 in. stops, 7/8 in. x 4 1/2 in. moulded and mitered trim with wall moulding. Trim both sides		
For door 2 ft. 8 in. x 6 ft. 10 in.	2	sets
For door 2 ft. 6 in. x 6 ft. 10 in.	2	sets
For door 2 ft. 4 in. x 6 ft. 10 in.	2	sets
For door 2 ft. 2 in. x 6 ft. 10 in.	2	sets
For door 2 ft. 6 in. x 6 ft. 8 in.	7	sets
For door 2 ft. 4 in. x 6 ft. 8 in.	3	sets
For door 2 ft. 0 in. x 6 ft. 8 in.	2	sets
For door 2 ft. 4 in. x 7 ft. 0 in.	1	set
For cellar doors. (Plain)—		
For door 2 ft. 6 in. x 6 ft. 6 in.	2	sets
For door 2 ft. 6 in. x 6 ft. 0 in.	1	set
Trim for inside of exterior doors—		
Front ent. 3 ft. 2 in. x 7 ft. 0 in.	1	set
Rear ent. 2 ft. 6 in. x 6 ft. 10 in.	1	set
Cellar ent. 2 ft. 6 in. x 6 ft. 0 in.	1	set
Garage ent. 8 ft. 0 in. x 7 ft. 10 in.	1	set
Doors to living porch 2 ft. 8 in. x 6 ft. 10 in.	2	sets
Trimmed openings finished same as for doors.		
Opg. 5 ft. 0 in. x 6 ft. 10 in.	1	set
Arch Openings—		
Opg. 2 ft. 2 in. x 7 ft. 10 in.	1	set
Opg. 2 ft. 10 in. x 7 ft. 0 in.	1	set
Trim for windows—		
7/8 in. x 4 1/2 in. moulded and mitered trim with wall moulding, 1/2 in. stops, 1 1/8 in. moulded stool, 7/8 in. moulded apron, 5/8 in. x 7/8 in. cove under stool.		
For windows, triplet, ea. side 1 ft. 8 in. x 5 ft. 6 in., center 3 ft. 0 in. x 5 ft. 6 in.	2	sets
For windows, triplet, ea. side 1 ft. 6 in. x 5 ft. 6 in., center 2 ft. 6 in. x 5 ft. 6 in.	2	sets
For windows, triplet, ea. 1 ft. 8 in. x 5 ft. 6 in.	2	sets
For windows, single, 3 ft. 0 in. x 4 ft. 10 in.	1	set
For windows, triplet, ea. 2 ft. 6 in. x 3 ft. 0 in.	1	set
For windows, single, 1 ft. 8 in. x 2 ft. 0 in.	1	set
For windows, single, 2 ft. 6 in. x 3 ft. 0 in.	1	set
For windows, mull. ea. 2 ft. 6 in. x 3 ft. 0 in.	1	set
For windows, single, 3 ft. 8 in. x 4 ft. 4 in.	2	sets
For windows, single 3 ft. 0 in. x 4 ft. 4 in.	6	sets
For windows, single 2 ft. 6 in. x 3 ft. 0 in.	1	set
For windows, mull. ea. 1 ft. 8 in. x 4 ft. 4 in.	1	set
For windows, mull. ea. 2 ft. 6 in. x 1 ft. 8 in.	1	set
Base—7/8 in. x 6 in. moulded	370	lin. ft.
Base—7/8 in. x 4 in. plain	60	lin. ft.
2 in. base mould	370	lin. ft.
1/2 in. quarter round at floor	450	lin. ft.
Picture moulding, 7/8 in. x 2 1/4 in.	350	lin. ft.
Mantel for living room	1	unit
Chair rail, 3 1/2 in. moulded	160	lin. ft.
5/8 in. x 1 in. moulding for panels	650	lin. ft.
Panel work under jib of main stairs, wood stiles and rails, plaster panels, 6 in. x 7 in.	1	Unit
Interior doors—		
(2 cross panel birch veneer)		
Door 2 ft. 8 in. x 6 ft. 10 in. x 1 1/2 in.	2	
Door 2 ft. 6 in. x 6 ft. 10 in. x 1 1/2 in.	2	
Door 2 ft. 4 in. x 6 ft. 10 in. x 1 1/2 in.	2	
Door 2 ft. 2 in. x 6 ft. 10 in. x 1 1/2 in.	2	
Door 2 ft. 6 in. x 6 ft. 8 in. x 1 1/2 in.	7	
Door 2 ft. 4 in. x 6 ft. 8 in. x 1 1/2 in.	1	
Door 2 ft. 0 in. x 6 ft. 8 in. x 1 1/2 in.	2	
Door 2 ft. 4 in. x 7 ft. 0 in. x 1 1/2 in.	1	
Doors with 20 in. x 68 in. bevel plate mirror, one side—		
Door 2 ft. 4 in. x 6 ft. 8 in.	2	
Solid fir cellar doors—		
Door 2 ft. 6 in. x 6 ft. 6 in. x 1 1/2 in.	2	
Door 2 ft. 6 in. x 6 ft. 0 in. x 1 1/2 in.	1	
Whitewood access door and trim.		
Door 1 ft. 6 in. x 3 ft. 0 in. x 1 1/8 in.	1	
Tin clad door to garage, with frame and trim both sides—		
Door 2 ft. 6 in. x 6 ft. 0 in. x 1 3/4 in.	1	
Closet shelving 7/8 in. x 12 in. pine	35	lin. ft.
Hook strip (7/8 in. x 4 in.)	25	lin. ft.
Rabbeted shelf cleat	20	lin. ft.
1 in. dia. pipe clothes rod	14	lin. ft.
Pantry cupboard with countershelf, doors, drawers, etc.—		
Front 7 ft. 4 in. x 8 ft. 0 in.	1	Unit
Main stairs 1st to 2nd floor—		
14 risers, 3 ft. 2 in. wide, exposed string balustrade at 2nd floor, etc.	1	Flight
Cellar stairs, 12 risers, box pattern	1	Flight
Attic stairs, 13 risers, box pattern	1	Flight

General Conditions

Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges.

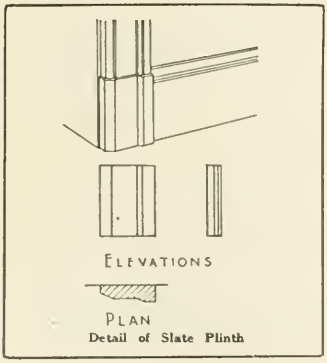
Allow for general work not listed, such as grading, planting, etc. Include sub-bids such as hardware and applying same; painting and decorating; plumbing and gas fitting; heating, and electric work.



A Missouri Modern School

By P. H. PATRICK

THE modern school building pictured here was completed in June, 1921. It was built at Brookfield, Mo., from plans prepared by W. E. Hulse & Co., architects, Sioux City, Iowa, and it fills the needs of 700 school children most admirably. Perhaps the imposing entrance attracts more notice than any other feature of the exterior, the whole effect, carried out in brick and limestone, is simple, pleasing, and massive.



Detail of Slate Plinth

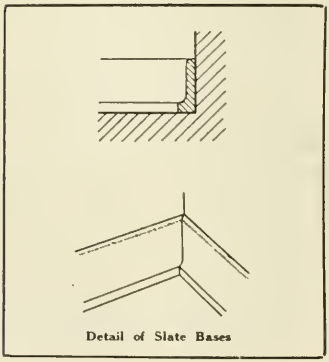
Two short flights of stairs on the exterior lead to the first floor while the low and central door leads direct to the ground floor and to the combined auditorium and gymnasium which is located in the basement. The idea of combining auditorium and basement as used here, is both economical and practical. The polished floor for gym work, furnishes seating room for concerts, lectures, etc.

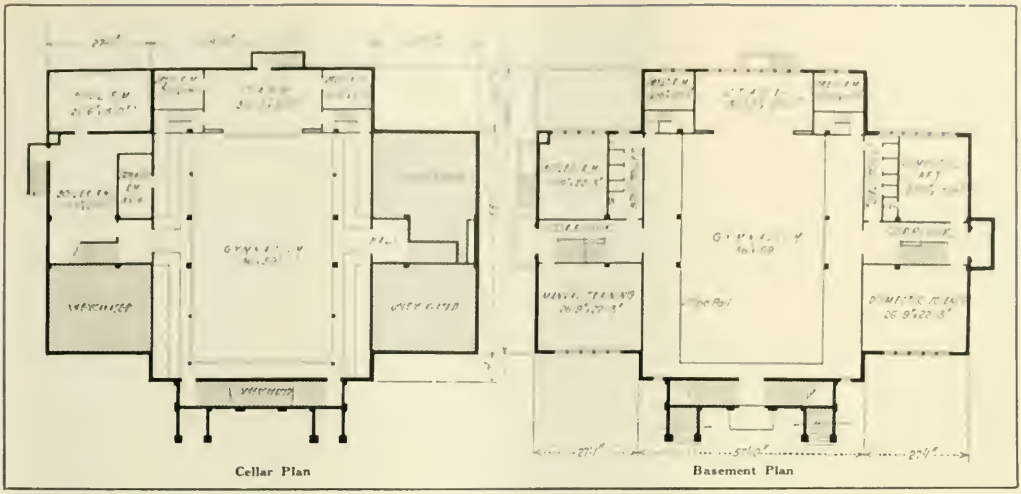
A storage room is provided for extra seats and the storing of gym equipment when it is not in use. A good size stage, with a dressing room at either end and racks above for storing scenery is also included.

A boiler room and fuel room also finds space in the basement. This boiler room has its own separate outside entrance. Exits are provided on all four sides so that the auditorium is safe in this respect. On the ground floor besides the upper part of the auditorium and gymnasium is placed the manual training room, also rooms for domestic science, domestic art, with toilets accessible from the corridors and opposite sides of the floor.

The first floor contains six grade rooms and a teachers' room and an office. The corridors are wide and glass panelled doors open into them.

Each class room is provided with blackboards and wardrobes. All outer doors are equipped with anti-panic locks, the bars of which automatically unlock when pushed upon. The second floor plan shows eight grade rooms. These are fitted up similarly to the class rooms on the floor below.


Detail of Slate Bases

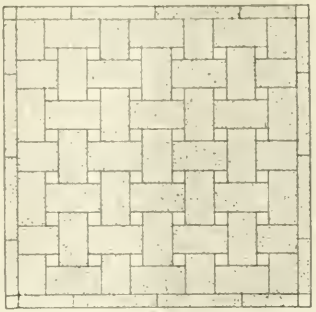


Cellar Plan

Basement Plan

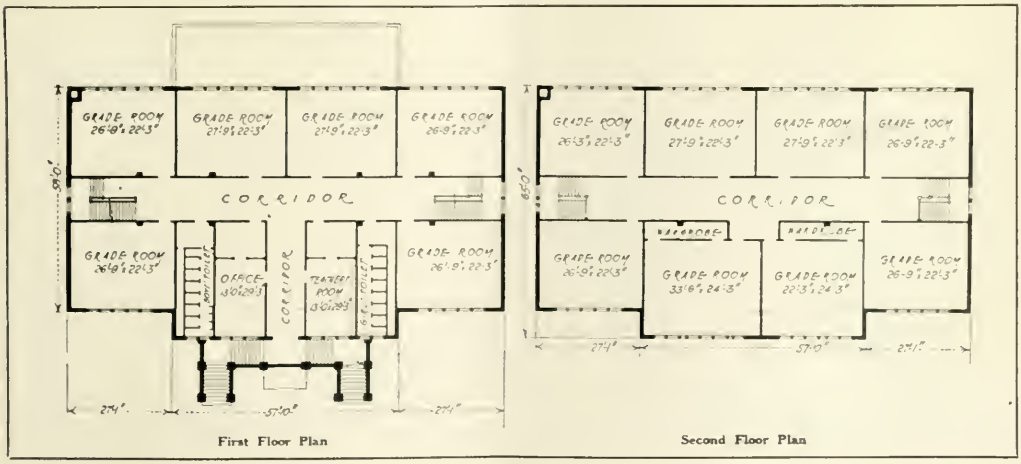
In the selection of materials for the interior finish of school buildings, there are certain portions, particularly the floors and wells of entrances and corridors where the choice is limited to a material which will resist the hard usage usual to these locations. The floor should be of a material which can be easily washed and kept clean and sanitary. Floors of slate or of slate with a tile insert as shown in our illustration form an effective and practical floor which is resistive to wear and is sanitary.

For the side walls of corridors, etc., the use of slate wainscoting is a protection to the walls in that it affords a strong rigid moisture-proof surface to take care of the natural rubbing against the walls by pupils of all ages and various heights.



Design for Slate Floor, Tile Inserts Lend Color

We show an illustration of how slate is used for base when there is a slate wainscot, but the slate base can be used at the bottom of side walls in connection with floors and walls of any material. In this position, slate is particularly of value in that the floors may be washed or cleaned without damage to the side walls above the slate base. Where slate or other similar material is used for the bases of side walls, the use of slate plinths out of the trims of door openings, adds protection to the wood trim of these openings.



First Floor Plan

Second Floor Plan

Boiler and Gas Range Without Legs

Novel Arrangement for Kitchen Which Leaves Entire Floor Clear



BUILDERS on the lookout for new methods of installing equipment of buildings will be interested in the accompanying picture which shows a gas range and hot water boiler supported by brackets from the wall, the usual legs have been entirely eliminated and a clear floor space underneath is the result, cleaning the floor is thus far easier done than when one has to work around the obstructing legs.

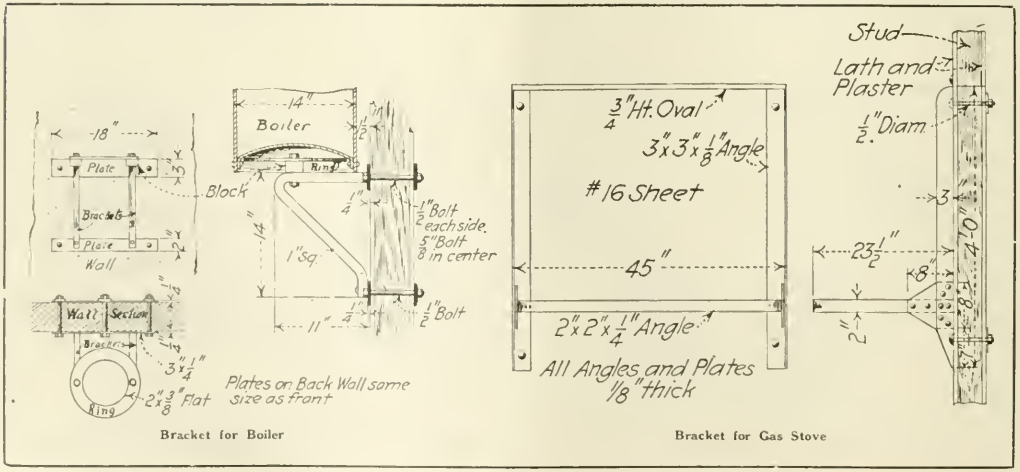
In this case, before the plastering was applied, small angle irons were fastened to studs and smaller angle iron brackets supported the stove and boiler, this gave it a solid support.

Here is a novel method of installing kitchen fixtures that will be welcomed by many housewives, and the builder suggesting this arrangement will gain the reputation of doing an up-to-date job.

The drawings given below clearly show all the details of construction for the making of these supporting brackets. It is essential, of course, that a good, solid support be had against the wall, as there is considerable weight to be carried both in the boiler as well as the gas range.

As a protection to the wall the space in back of the stove is covered with a piece of No. 16 gauge galvanized sheet iron, which has been painted black to correspond with the stove. The iron supports are simply made from light structural steel.

This interesting kitchen arrangement was devised and installed by Mr. William H. Force, Jr., in his own residence at Madison, N. J.



Building Homes That Save Coal

How Heat Is Lost from Poorly Built Houses

By J. D. HOFFMAN

Professor of Practical Mechanics, Purdue University

THE ordinary type of small house can be made just as resistive to the loss of heat as can a large office building, and at a very small additional cost. In the average frame house, it is usually the practice to have only one-half inch of lath and plaster separating the room space from the space between the studs. Lath and plaster is a very poor insulator, as it is porous, and the heat from the room easily goes through this material and enters the space between the studs, only to be carried to the attic by convection, or to be passed through the sheathing to the outside air. The effect of this air movement through the walls and partitions can be easily observed on any old plaster wall and ceiling. The dust carried by the air currents will have penetrated the plaster between the lath, and left a series of dark streaks upon the plaster and the wall paper.

Many buildings are constructed with this hollow space within the studs opening up directly into the basement space. Such construction

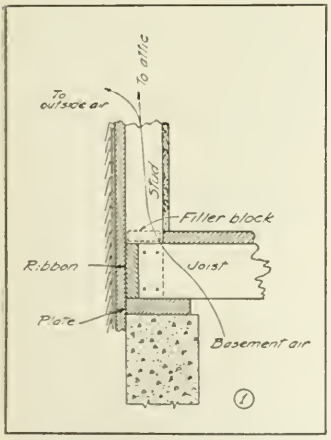


Fig. 1, showing air space between the studs and how the air is carried by convection through from basement to attic, carrying the heat to the outside air. Also shows method used for stopping up space between studs with block at floor level, may be used in both old and new jobs.

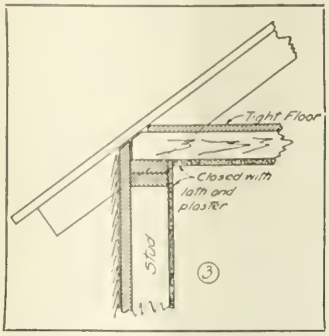


Fig. 3 shows a recommended detail for closing all air spaces between the studs and joists at the ceiling. The most effective method is to floor over the entire upper side of the joists with any good, tight flooring material.

is extremely bad, and it should be corrected. In old buildings, where the studs extend to the plate, and the floor meets the inside edge of the studs, this space is probably open.

The way to remedy this error is to insert filler blocks between the studs on the level with the floor. In new construction, it is best to floor over the entire first floor or subfloor between the sheathing, on all sides, and set the studs upon a plate placed upon this floor. (See illustration.) This will effectively cut off all air communication between the basement and the stud spaces. In attics, where the joists are laid upon the rafter plates, these spaces are usually cut off; but in attics where the floor is lowered to obtain head room, the spaces between the joists and between the studs must be closed with tight sheathing, as shown in the diagram. It is important to make sure that all stud spaces are tightly closed at top and bottom. This process is often known as fire stopping.

For the exterior finish provide straight, solid boards, with ship-lap or tongue-and-groove joints, and see that they are well laid. A good grade of building paper should be placed underneath the sheathing, also between the studs and inside lath and plaster. The best application of the latter is to nail the building paper onto the studs and then attach the lath to furring strips over the paper.

Pieces of studding material, commonly called "fire-blocks" should be nailed between the studs at a point midway between the first and second floors, to still further reduce convection. This treatment will also tend to decrease the fire hazard of the building.

One of the worst conditions to meet is the bungalow with one or two second story rooms. These upper rooms are frequently hard to heat and special precautions should be taken in the design of the structure. The principal difficulty lies with the attic spaces beside and above these rooms. Usually no attempt is made to floor over these spaces, and it is often found that the heat losses in this type of house are greater than in a two-story building. It is necessary to floor over all such sections with some type of insulating material. This is a good place to use wall board as it is easily fitted in place.

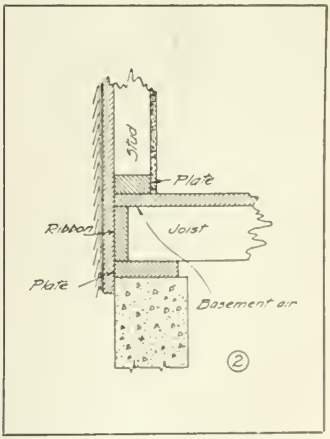


Fig. 2 shows the details recommended to be used in new construction. Here the flooring is laid all around to the sheathing, and the studs are set on plates resting upon the floor. No air can be carried up between studs, therefore no heat lost. Also prevents spread of fire.

1. Cut off all spaces between the studding, from the basement and the attic.

2. Insulate all outer walls with good ship-lap or tongue-and-groove siding, well laid.

3. Always use a good quality of building paper over the sheathing.

4. One layer of building paper laid over the inside of the studs is recommended.

5. Floor over all attic spaces with a tight floor.

6. Sheath with ship-lap or wall board, or other equivalent, over all studded walls between upper floor rooms and attic space.

7. Insulate all floors that come in contact with cold air, where these rooms are to be used for other than sleeping porches.

The average citizen does not realize what great sums of money are lost every year because of improperly designed homes. The following statement will establish the value of extra expenditure for the conservation of heat. In Indiana, alone, the public spent about $54,000,000 for domestic fuel in 1920. If all heating units had been operated efficiently during that year, at least ten per cent of this money could have been saved. This ten per cent, amounting to $5,400,000, would have been sufficient to run all the colleges and universities of the state for one year, and the public would not have been asked to provide one cent additional for the purpose. If all residences had been constructed so as to conserve heat, the saving would have been nearer twenty-five per cent than ten.

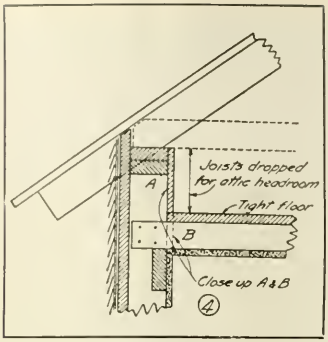


Fig. 4 shows the best detail for insulating the upper floor where the hoists are dropped below the eaves to afford room space in the attic. The open space A and B should be closed up with tight sheathing and a perfectly tight floor laid. Any good wall board can be used to cut off space A.

It is self-evident that, if all buildings in the states where heating is necessary were built as suggested in this article, an enormous amount of money would be saved each year. The cause of conservation is one that deserves the full support of every contractor and architect in the United States.

The above are extracts from a paper read by the author at the National Construction Conference held in Chicago, April 5, 1922.

Building Construction Fire Hazards

By CHARLES C. DOMINGE

BUILDINGS in course of construction are usually considered good fire risks, especially if of brick or fire resistive construction. Theatres, churches, halls and other types of buildings calling for a large open floor space are not as desirable course of construction risks as those of ordinary type, owing to the great amount of scaffolding necessary to complete and finish the high interior of the building.

Up to several years ago, most fires in this class have been caused by the use of "salamanders" or open fire stoves or gasoline torches as used by careless mechanics. Electricity, generally of a temporary and makeshift nature, with its exposed wires, is responsible in some cases, as is evidenced by the severe loss several years ago in the Pennsylvania Hotel in New York City. In this case a temporary overhead wood platform was erected on the grade so that pedestrians could traverse the street. Under this platform the temporary electrical installation and switchboard were installed. A fire, apparently from defective installation, started at this point and was severe enough to destroy over 150 feet of the limestone front of the building under the platform and severely scorched buildings on the opposite side of the street.

Several months ago, the fire department responded to three fires in two weeks in a building in course of construction on Maiden Lane, New York City, the cause being either red hot rivets or red hot particles from acetylene welding apparatus dropping on canvas covered platform or oil soaked litter on the floors.

In these new buildings asphaltum paint is used to coat the interior walls to keep them waterproof. The usual method is to build a wood fire directly on the fireproof arches of the floor and then place a bucket filled with asphalt on the fire in order to keep the asphalt from becoming too thick, thereby making it easier to apply to the walls. A fire of this kind must be constantly watched, otherwise the liquid will boil over and start a fire which is hard to extinguish.

During the winter months, buildings in course of construction house practically all the combustible materials to be used eventually in the interior finishing, and at this time there is a considerable amount of packing cases containing glass with excelsior, straw and hay packed between.

The writer has seen workmen removing the glass from the cases and scattering the packing material over a great portion of the floor. Smoking and filling kerosene lanterns are also hazards met with.

In conclusion many losses occur at the eleventh hour, when the building is almost ready to be turned over to the owner. At this stage, carelessness on the part of painters and decorators in the handing and storage of their supplies, and oily rags and waste help to increase the loss ratio.—Extract from paper to National Fire Protection Association.

Modern Church *of* Gothic Design

HENRY J. SCHLACKS, Architect

CHURCHES quite often reflect their denomination in their exterior design and this is true of the Catholic church of which a picture's shown on this page and which is located at Oak Park, Ill.

The exterior is carried out along the lines of Gothic architecture. The main body of the church consists of three large mullion windows with buttresses between; a transept with two larger mullion windows and the narthex which is entered by the side entrance shown here, and also a front entrance located in the center of the front.

The mullions of these windows are of wood carried out in simple Gothic style. Stained glass is used in all the windows with an outside protective covering of rib glass.

The interior has also been carried out in Gothic style with a groined ceiling of both nave and aisles. This is finished in plaster with ornamental rib work.

The organ is placed in a loft situated over the vestibule or narthex and a handsome memorial stained glass window is placed above the organ console. The exterior of this window does not show in our picture, but it is similar to the two windows, it is placed directly over the central entrance.





Exterior View, Showing Decorative Mullion Windows



Building a Daylight Factory

Pleasing Design Embodied in Practical Commercial Structure

TURNER CONSTRUCTION COMPANY, Designers and Builders

THE interesting series of pictures shown on these two pages illustrate the construction of a reinforced concrete factory which has just been completed for Messrs. Kops Bros. at Ozone Park, Long Island, New York.

The above picture of the completed factory was taken May 20th, 1922. The evergreens, shrubs, grass and hedge have just been planted, and in a few years when these have had a little growth, this factory will be an interesting example of commercial architecture, one in which some attention has been given to beauty, as well as utility.

Unlike a great many factory buildings, it sets back from the street so that a decent size lawn is possible in front.

The owners evidently take a good deal of pride in having a nice looking factory. Being keen business men, they know people will talk favorably about the building and they also realize that they will have more contented employees when they work in a nice looking factory.

This interesting building was designed and erected by the Turner Construction Company of New York, and while no effort was made to beat any construction records, it was completed in a very short time.

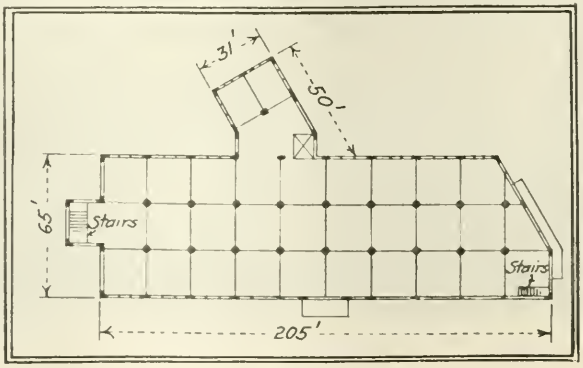
The series of pictures that we show illustrate the progress made at different dates in the erection of this factory. In designing this building, the builders took into consideration that additions may be required in the future, therefore the walls and interior columns have been made strong enough to carry several extra floors.

Although plain in its design, the lines of the exterior are quite pleasing, consisting of a number of sash bays set in between concrete piers. The top of each pier has an ornament in tile which gives it a distinctive appearance that is pleasing.

A variation has been made in the central bay design as this is divided into three sections; the middle serves as the vestibule to the front entrance; this vestibule projects beyond the main structure and gives a pleasing break in its appearance.

As the walls are practically entirely of sash, a maximum amount of light is secured from the interior. Of course, all this sash is of steel.

In the erection of this factory, rein-





October 25th, 1921



November 12th, 1921

forced concrete construction was employed, being poured in wood forms. The runway shown in the November pictures was a very handy contrivance and saved a lot of hoisting which otherwise would have been necessary. Fortunately, this runway could be used very economically, as the building was only two stories high.

As our pictures clearly show, a hoisting tower was used for the concrete and this was distributed by means of a spout to the desired location.

In making such hoisting tower, if it is no higher than 100 feet, the corner posts can usually be made of 4 in. x 6 in. timbers. For constructing such a tower with the necessary braces, etc., it would take about 2700 board feet for the timbering. This quantity of timber allows for a 2 in.x 10 in. bolted around at each 7 foot level with two sides having angle braces of 2 in.x6 in. all thoroughly bolted together.

A tower of this sort should be carefully made, so it may be taken down and rebuilt wherever it is needed. When a tower is to be used as a standard piece of equipment it should receive several protective coatings of paint. It will look better and will save you money. The painting should be done before erection. It is really surprising what one of these towers cost; according to some figures that we have seen, $4.50 to $5.00 per foot of height is a fair average, so be careful to include enough in your estimate to cover this item. When a wood tower is bolted together, the dismantling is much easier than when spiked.

The following data, on what the plant consists of, from the revised edition of Arthur's New Building Estimators' Handbook will be of considerable interest:

The concrete gravity plant consists of a hoisting bucket in a tower, a receiving hopper near the top of the tower, and a series of gravity chutes for distribution to the form.

If the concrete is delivered to the chutes in a plastic, viscous, homogeneous condition, it will flow generally on the following slopes, which have been found to be successful and are used by many contractors:

Small gravel, 1 to 3 or about 18° with the horizontal.
1 in. stone, 1 to 2¼ or about 20° with the horizontal.
1½ in. stone, 1 to 2½ or about 22° with the horizontal.
2 in. stone, 1 to 2¼ or about 24° with the horizontal.

The unit cost of placing concrete by the gravity plant is controlled by many factors, the size of the mixer, the preparation of the forms, the rate of wages paid, the quantity of concrete to be placed from one installation, the general character of the work and the experience and intelligence of the operating crew.



December 13th, 1921

February 16, 1922

November 30, 1921

Structural Work Ready



Sun Parlor *and* Garage Feature *of* This Home

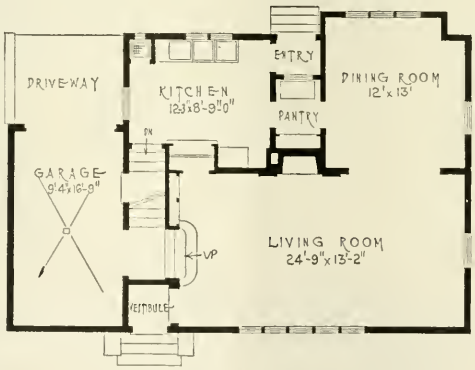
INTERESTING indeed is the layout of the home shown on this page. By the owners and architect it has been termed "Chateau Amerique," it being modeled after a French private residence, but adapted to American conditions.

The most interesting feature is the sun parlor, placed over the garage, both of which are integral parts of the house; the garage is entered from the rear, so that the appearance of the front of the house is not marred in the least.

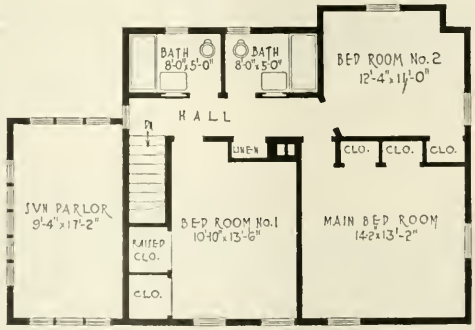
There is a slight slope in grade towards the rear of the lot, and this was taken advantage of so that the garage level is slightly lower than the street grade.

The main entrance is direct into the living room through a vestibule. As will be noticed, there are a number of steps and an additional step in the vestibule so that the house sets up rather high. This was arranged so as to give plenty of height in the garage.

As this house is located close to Long Island Sound, raising the sun parlor in this manner enables the occupants to have a very pleasing view of the water, the elevation being sufficiently high to overlook the tops of the intervening low trees.



First Floor Plan



Second Floor Plan

The pantry, between dining room and kitchen, is an interesting feature, enabling the ice to be placed in the refrigerator without iceman coming into kitchen. The refrigerator in this location is convenient to both kitchen and dining room.

The two bathrooms on the second floor are quite an innovation. It is rather an unusual arrangement, but has proved quite popular. Each of the bedrooms is provided with abundant closet room, and there is also a large linen closet opening into the hall.

The house as shown here is constructed of frame covered with stucco. The rooms are exceptionally large in size, due to the fact that there is no space used unnecessarily for halls.

This interesting home was built at Malba, Long Island, New York, by the Malba Estates Corp. from plans prepared by H. B. Knowles, architect, of New York.

What the Editor Thinks

Farm Improvements

ON another page of this issue we give an outline of a loaning system for farmers. This opens up a vast field of construction work along the line of farm improvements both in new buildings and repairs as well as equipment. As soon as a lull occurs in the building of houses in our cities and towns a big business for the builders in the East will be that of farm improvements, and many years of profitable work are ahead in that line.

It will be well for the builders to be ready to take care of this line of business in the near future. Find out about modern farm requirements, be ready to render real service.

Roof Improvements

UNCONSCIOUSLY to most of us, there has been quite a revolution in roofing within the past 20 years. The old time sameness and monotony is disappearing from our sky lines.

Roofs today are much more attractive than in the old days. There is more color to them and greater variety. The old wood shingled roof is transformed by means of colored stains and methods of laying so that many artistic results are obtained entirely different from anything that our building predecessors ever used.

The newer type of roofing has come into use, giving variety, color, attractiveness and fireproof qualities. Asbestos, slate, asphalt, tile, composition, zinc, tin, copper and galvanized iron all lend themselves to artistic treatment and practical use.

We recently saw an interesting example of corrugated galvanized iron roof, which looked very attractive. This was painted with the dark brown metallic paint, then covered with the second coat of light chrome green which was rubbed off in spots and streaks so as to reveal the brown under coat. This gave the appearance of bronze and made a very attractive appearing roof.

Even by the use of ordinary materials, we are obtaining artistic results. Much of the benefits of this new order of things is directly due to the instructive advertising that is being done by the manufacturers of these various products. All this is tending to increase the beauty and usefulness of our buildings.

The Apprenticeship Question Again

CONSTRUCTION work in many localities has been slowed up on account of the lack of sufficient skilled labor.

Recently in Washington, builders who were anxious to complete their contract in a certain time paid as high as $16.00 per day for bricklayers! This is a condition of affairs that deserves decisive action. The question arises: "Why have not the young men gone into the building trades?"

American young men are as bright a lot as can be found in any country. Evidence of this fact will be vividly recalled if you will think back but a few years.

Several hundred thousands of our young men were called upon for the war, and they had to take up, not only the terrible battle part, but many mechanical trades that were entirely different from their previous vocations. We need not remind our readers that they did well—that is a matter of history.

The same spirit of winning that was shown in the war can also be made use of in peacetime pursuits, and the building trades can get their share of enthusiasm if they will offer the right inducements for the young men to come in.

There has been too much of an attitude of "stay out, the field is overcrowded." In other words, no inducements were made for young men to enter the various trades. We are now paying dearly for this oversight of ours.

The different building trades offer as attractive a calling to follow as any. Skill, endeavor, courage and strength, always interest young men. They have a chance to use all in the building game.

Stucco Protection

WHEN applying the dash coat to stucco, it is a very wise precaution to cover the roof, trim, etc., with pieces of sheathing paper which can be lightly tacked down.

The spattering of the stucco will then be prevented from falling on the roof, trim, etc., and will save a good many hours of work usually spent in cleaning it off.

We have noticed asbestos roofs, the appearance of which were badly marred by the spattering of stucco; through carelessness this was allowed to harden and it was quite a job to make a presentable looking roof. A worse case was one where asphalt shingles were used.

The little precaution of covering finished work before the dash coat of stucco is applied will save all this annoyance and expense.

Business Ability

BUILDERS are merchants in every sense of the word, in all relations with their customers. Just like a storekeeper who wants to have a satisfied customer the builder should do his utmost to please, and successful builders are the ones who stay in business in one location and are known as the successful contractor.

There is a type of builder who comes to a town and gets hold of somebody who intends to build, makes all sorts of promises of wonderful work at a marvelously cheap price, and then "beats it" when first or second payments are made, owing bills for materials, labor and board.

Another type of builder takes hold of a contract and will "skin" the job at every possible point, quite often, fortunately, they come seriously to grief.

Others, when a mistake is made will insist that it is right and that the owner accept it. Now, when a mistake is made, the easiest and most pleasant thing to do is to admit the mistake and have it done right. The owner thinks so much more of you and you are only doing the square thing at that.



CARPENTRY

Good Practice in Frame Construction and Finish

How to Frame a Roof of Unequal Pitch

By RICHARD M. VAN GAASBEEK
School of Science and Technology, Pratt Institute, Brooklyn, N. Y.

CONTINUING the problem from our July issue, we can now proceed to lay out the hip rafter. In our next article we will show how to lay out the valley rafters.

The hip rafter travels the diagonal distance of an oblong with reference to the plates of a building, due to the fact that the roof surface on one side of the hip rafter has a greater pitch than the roof surface on the opposite side. The top edge of all rafters must be in alignment to receive the roof boards. The plancher level should be level throughout the entire roof. The outside lines of the roof that are seen, or facia lines, must intersect.

Referring to figure 12, an enlarged section through R-R, figure 1, it will readily be seen that the hip rafter traveling the diagonal distance of an oblong, intersecting with the return corner on the facia line, crosses the plate at an angle, A-B, figure 12. The hip rafter only crosses the corner of a building in roofs of equal pitch, where the roof surfaces on both sides of the hip are the same pitch and the hip travels the diagonal distance of a square or crosses the plates of a building at an angle of 45 degrees.

In all roofs of equal pitch the run of the hip rafter is 17 inches for every foot of run of the common rafter, or the diagonal distance of 12 and 12 inches. This rule then cannot apply in roofs of unequal pitch because the hip rafter runs the diagonal distance of an oblong, it therefore becomes necessary to determine the rise in inches per foot of run, so that the constant unit of 12 inches can be used in framing all the rafters throughout the entire roof. The total rise of the hip rafter is determined by the pitch of the long common rafter, to conform to the requirements of the specifications, or a total rise of 11 inches.

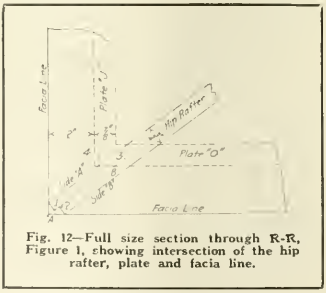


Fig. 12—Full size section through R-R, Figure 1, showing intersection of the hip rafter, plate and facia line.

Take the run of the hip rafter from the layout, figure 1, measuring from the return on the facia line to the butt joint against the valley rafter, A-T, figure 1, or run of 13 5/8 inches. Thus with a total rise of 11 inches and total run of 13 5/8 inches find the rise in inches per foot of run. The formula is:

$$\frac{\text{Rise in inches}}{\text{Run in feet}} = \text{Rise in inches per foot of run.}$$

$$\frac{11}{13\ 5/8} = 9\frac{8}{12} = \text{Rise in inches per foot of run.}$$

Note: Reduce the last number to twelfths of an inch for an accurate reading, the standard steel square being laid out in twelfths so that it is an easy matter to make an accurate measurement. Another way to determine the rise in inches per foot of run is shown in figure 13. The same reading should be obtained provided the triangle has been laid out accurately. It is good practice to check up the figures with the graphic method to avoid errors. Lay off the run on the horizontal line, 13 5/8 inches and the rise on the vertical line, 11 inches and connect the two lines with a diagonal line forming a triangle. Measure off on the horizontal or level line from the intersection of the horizontal and diagonal line the unit for one foot run, 12 inches. Project a vertical or plumb line up from this point until it intersects the diagonal pitch line. The length of this vertical line from the horizontal base line to the diagonal pitch line is the rise in inches per foot of the rafter, or 9 8/12 inches.

Set the fence and square at 9 8/12 inches rise on the tongue and 12 inches run on the blade. Mark on the tongue for all plumb cuts and on the blade for all level cuts. Press the fence firmly against the top edge of the stock to be used and produce the facia line or first plumb line to the extreme left, A, figure 11. Slide the fence to the right and measure on a level line from facia line A, the run of the hip, 13 5/8 inches, and produce plumb line T, figure 11, the extreme length of the rafter forming

the butt joint against the valley rafter.

To simplify picking up the bevels, top cut, backing and other measurements required in laying out the hip rafter, draw in a section of the hip rafter and plate, full size on the layout, figure 1, as shown in the section, figure 12, which is a section through R R, figure 1.

Where the outside edges of the hip rafter intersects the facia line, square lines across at right angles to the center line, from both edges of the hip until they intersect the center line as at 1 and 2, figure 12. Also where the outside edge of the hip intersects the wall line, square a line across at right angles to the center line until it intersects the center line as at 3, figure 12.

To complete the layout of the lower end of the hip rafter, measure in on a level line the diagonal distance of the projection A-B, figure 12, from facia line A, on the side of the rafter, or 3 7/16 inches, locating wall line B. Square this line across the bottom edge of the rafter and locate the center point.

To make a fit against the wall at the proper angle measure in on the side of the rafter from wall line B, the distance B-3, figure 12, and produce plumb line 3, figure 11. Connect plumb line 3 through the center of plumb line B on the bottom edge as shown at 4, bottom view, figure 11.

To complete the birdsmouth measure down on facia line A from the top edge of the rafter, 5/8 inch, the width of the facia and produce plancher level F. Measure up from plancher level F on a plumb line 2 5/8 inches, locating plate level G.

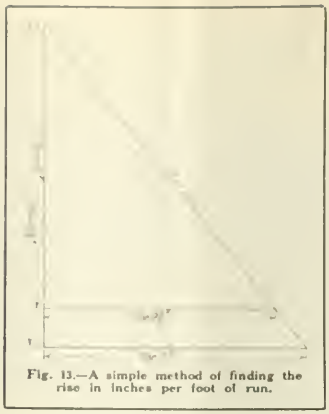


Fig. 13.—A simple method of finding the rise in inches per foot of run.

The hip rafter crosses plate O, the same plate upon which the short common rafters rest, therefore, the distance between plancher level and plate level is the same for both short common jack and common rafters and hip rafter.

To make the return on the facia line at the corner of the building measure back on side A of the hip rafter from facia line A, the distance A-1, figure 12 and produce plumb line 1, figure 11. On side B measure back on a level line from facia line A the distance A-2, figure 12, and produce plumb line 2, figure 11. Square facia line A across the top edge of the rafter and locate the center point. Connect plumb lines 1 and 2 on the side of the rafter with the center point on the top edge as shown in the top view at 5, figure 11. Cut on bevels 5 on the top edge and plumb lines 1 and 2 on the side of the rafter for the facia, on line F for the plancher level, on line G make a square cut and on line 4 on bottom edge of the rafter a bevel cut for the birdsmouth and on line T for the butt joint against the valley rafter.

Backing the Hip Rafter

To determine the amount of stock to be removed in beveling the corners of the hip to bring the center line in alignment with the center line of the jack and common rafters, produce a level line on either side of the hip. On side A from the top edge on this level line, point off the distance A-1, figure 12, as shown at A-1, figure 11. On side B from the top edge on the level line point off the distance A-2, figure 12, as shown at A-2, figure 11. Gauge a line through these points on either side of the rafter and also through the center on the top edge. Remove the corner between these lines as shown in the end view, figure 11.

The problem of laying out the valley rafters will be discussed in our next article.

Use *of* Wire *for* Bridging

HERE is something that will be new to most of our readers. Instead of using wood bridging with its expensive cutting, fitting and nailing cost, the builders of the New York Velodrome employed two strands of galvanized iron wire simply fastened by a bent-over nail.

The object of bridging is to transfer any extra load that may be placed on a certain joist to the adjoining ones as well as for stiffness. With wood, the bridging is subject to compression and the load is transferred downward along the diagonal bridgings to the bottoms of adjoining joists. With the wire bridging a reverse action takes place as the wires are subject to tension.





Beauty by Correct Proportion

RUNNING amuck is not only the habit of some South Sea Islanders, but is also a bad disease that grips some folks in the building profession.

Good materials and excellent workmanship are frequently employed in erecting buildings that are devoid of all architectural merit.

The individual details, however, are most excellent by themselves, but in the jumble that results, a horrible mess is the outcome.

The lower picture shows an interesting example of running amuck in architectural design. Here in the erection of a four-family apartment, excellent material has been used, the columns are well proportioned and the brackets are architecturally correct; so are the balustrades; but on account of lack of proper proportion in the designer's part the resulting structure is an architectural nightmare.

The same amount expended would have produced a handsome looking building if a proper exterior design had been used.

In direct contrast with this building is the one shown above. This has a considerable amount of ornament, but it has been used with judgment—brackets, balustrades and pilasters have been used to secure a harmonious result.

If the same guiding spirit that designed the lower structure attempted the house shown above, he would have made a mess of it, due to his entire lack of knowledge of the simple elementary principles of architectural proportions.

The rules regarding the different orders of architecture are well known, —they appear in practically every book on architecture and building construction, and it is a pity that a little more pains was not taken to get proportions right.

One glaring fault with the design in the lower illustration is the entablature. It is entirely too small for the size of the columns used. Note also particularly the treatment of the brackets above the columns in both illustrations. In one it results in a pleasing design, and in the other it is awkward, the brackets appearing as though they are about to fall down. The balusters have also been set a little too far apart, and the rails on top are not heavy enough.



Lots of Good Detail Here, But All Spoiled by Incorrect Grouping and Lack of Proper Architectural Proportion

OFFICE and JOB MANAGEMENT

Things the other man has found out that save money



How We Find Actual Cost *of* Building

By LEWIS BOWMAN

THE actual cost of the material and labor in a building is naturally the most important factor in the total cost. After this has been determined it is not a difficult task to add the overhead and profit and thus determine the final estimate. By that I mean, that a builder in figuring on a garage costing about one thousand dollars may feel that a small operation like this should net him a slightly larger percentage of profit than on an entire building costing ten times as much. But that, as I said before, is the purely business side of the question and the amount he secures above the actual cost is dependent upon his salesmanship and the condition of his business at the time the bid is sent out.

If a builder attempts to run his estimating in a systematic and logical manner, so that anyone can pick up

GRAMATAN HOMES INC.
COST RECORD SUMMARY

JOB NO.____ OWNER____ LOCATION____

| | WORK | | |

his cost sheet and tell exactly the cost that each individual item is figured at, he should have regular estimating sheets printed for the purpose. We are assuming that the builder is specializing in one class of work in this article—namely country houses, because it is perhaps easier to carry one idea through in an article of this kind than to dart into other phases of the building business and mix the conditions.

Also as we handle only this type of houses ourselves, our knowledge of this particular and special business is more concrete and the suggestions that are made in this article after the trial of various systems may prove more valuable perhaps to anyone who is attempting to secure the fundamentals of this most interesting and perplexing branch of building.

After the average builder has placed a bid in competition with several others, finally finds that he is the lucky—or unlucky bidder, if he is wise, the first thing that he turns to is his cost sheet—that cost sheet at this time has a very magnetic influence. The desire to count the unhatched chickens may be the cause—that is bad business—or he may want to turn the sheet over to his bookkeeper for entry into the ledger, which is real system—or he may want to find out why he received the contract; if he left out anything—which is human nature.

There is a cartoon hanging over the desk of our general superintendent, depicting a "successful bidder" looking pessimistically at an awarded contract—and the caption which is the *burden* of his thought reads "I wonder what I forgot."

And that is the builder's constant bugbear in estimating; namely, what he forgot to include as part of his cost. We have solved this phase of our system by the use of a detailed estimating sheet which contains every item that usually goes into the country house; at the end of each branch of the work are enough blank spaces to enable one to take care of the varied conditions of the individual houses. These sheets could, of course, be extended for larger and more costly work and the experienced builders and contractors of larger operations have systems that entail pages of indexed items to be carried through.

The system I am speaking of now, and of which the illustrations are given, for the man who is constructing our greatest need of the hour, namely—housing facilities, Usually the builder of this type of house is cautious about having large office costs; his business force is small, as it is more often than not—a one-man affair, as far as ownership is concerned. And then more than ever is a detailed and printed cost sheet of inestimable value—our sheet is just as useful to an office with one clerk as in ours, where it is checked over by three persons before being finally submitted.

The principal thing, of course, is to have a definite reminder in front of one all the time. A general schedule being on the wall is good, or a general form from any of several good books on the subject. While there may be lists published that I have not seen, the common fault with most of those now on the market is that they contain items pertaining to building generally instead of the particular branch wanted. Such a list can be condensed—and after a little study can be copied and used as a standard form for individual cases.

GRAMATAN HOMES, INC.

Job No.
Location
Owners
Address
Architect
Address

Remarks

Payable Less

MASON WORK

Excavation and Rough Grading
Footings
Foundation Walls
Exterior Piers
Interior Piers
Lally Columns
Piazza Walls
Stone Steps
Concrete Steps
" Hearths
Side Pieces
Cellar Floor
" Window Sills
" Door Sills
Chimneys and Caps
Leader Drains
Deafening
Clean-outs and Doors
Brickwork (Common)
" (Face)
" (Enamel)
Sidewalks
Waterproofing
Rubbish Removal and Cleaning
Watchman
Iron Work
Water (Temporary)
Whitewashing
Terrace Floor
Coping
Water Tables
Temporary Heat
Ash Chutes
Dampers (Chimney)
Blind Drains

STUCCO

On Exp. Metal
" Brickwork
" Dormers
" Chimneys
Water Tables
Band Courses

PLASTERING

Two Coat Work
Three " "
Sand Finish
Marked off Work
Exp. Metal and Scratch Coat
Cornices
Centers
Metal Corner Guards
Patching and Repairs

Figure 1

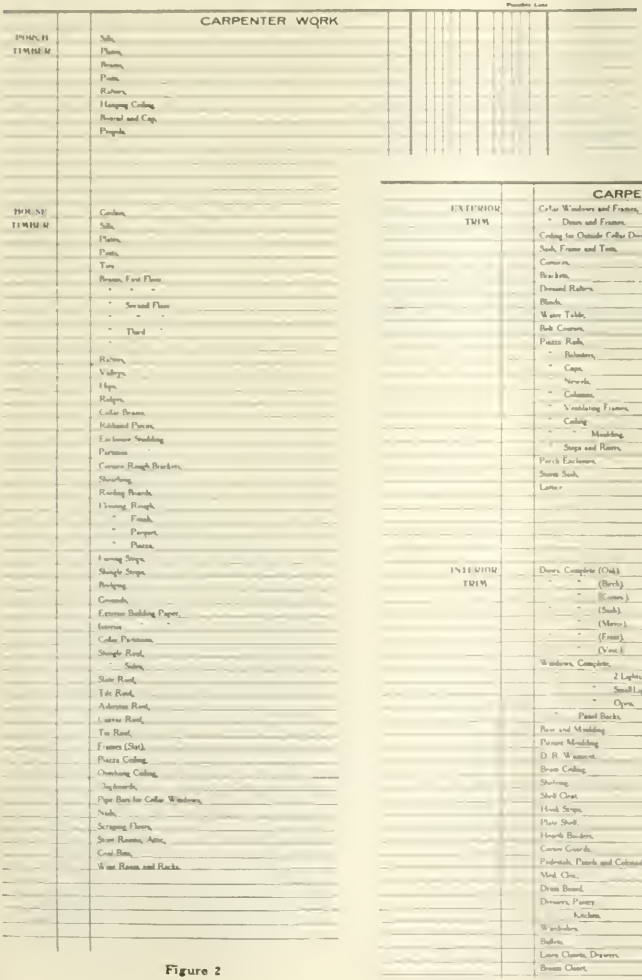
But nothing can give as much satisfaction as having the sheet all tabulated so that after the plan or specification is looked at for certain printed items and they are not shown • or called for—to write "none" after such an item has a tendency to give the estimate a more stable appearance than a sheet showing merely the items that will be furnished. And the sheet also is a constant reminder of what is not figured and whether or not the architect is careless or has a loose specification; in submitting the bid these exceptions can be carefully noted for the architect's and owner's benefit.

It will help to clear up the problem of extras that are absolutely necessary—and which the builder knows are necessary. For the builder knows even more than the architect and owner what will be necessary to make the construction complete and thorough. This brings us to a point of digression that may not be out of place here—namely, the new theory that is being advocated in this country of submitting bids according to quantity estimates. It is quite prevalent abroad and in one sense places the responsibility on the architectural end of the work. This method gives the builder the quantity of dirt to be excavated, cubic feet of foundation and footing work, yards of plastering, etc. Most builders would, of course, prefer this as it would eliminate his chance of forgetting items or making a miscalculation in taking off his own quantities.

In Fig. 1 is shown a typical estimating sheet as used by our mason department. The form only is of interest as the detail refers only to our type of work. The form can be enlarged and added to suit the needs of the individual. It has proven of unestimable value to us from both a cost and record standpoint.

Fig. 2 shows a carpenter material sheet which is also compiled for our particular business. Together with these two sheets are others that have no bearing on this article but the summary sheet which brings in the total of the sub-divisions of the mason work, carpenter work, sub-contracts, etc., shown in Fig. 3 is the complete office total for the job.

(To be concluded in Sept. issue)


CARPENTER WORK

ROUGH TIMBER: Sills, Plates, Beams, Posts, Rafters, Hanging Ceiling, Bearing and Cap, Pergola,

HOUSE TIMBER: Girders, Sills, Plates, Posts, Ties, Beams, First Floor, " " Second Floor, " " Third, Rafters, Valleys, Hips, Ridges, Collar Beams, Kickband Plates, Enclosure Studding, Partitions, Corners, Rough Brackets, Sheathing, Roofing Boards, Flooring, Rough, " Finish, " Parquet, " Piazza, Furring Strips, Shingle Strips, Bridging, Grounds, Exterior Building Paper, Interior " " Collar Purlins, Shingle Roof, " Sides, Slate Roof, Tile Roof, Asbestos Roof, Canvas Roof, Tin Roof, Frames (Slat), Piazza Ceiling, Overhang Ceiling, Signboards, Pipe Bars for Cellar Windows, Nails, Scraping Floors, Store Rooms, Attic, Coat Bins, Wine Room and Racks,

Figure 2

CARPENTER WORK CONT'D.

EXTERIOR TRIM: Cellar Windows and Frames, " Doors and Frames, Casing for Outside Cellar Doors, Sash, Frame and Trim, Corners, Bay Lites, Dormer Rafters, Blinds, Water Table, Belt Courses, Piazza Rails, " Balusters, " Caps, Newels, " Columns, " Ventilating Frames, " Ceiling " " Moulding, Steps and Risers, Porch Enclosure, Storm Sash, Louver

INTERIOR TRIM: Doors, Complete (Oak), " " (Birch), " " (Cherry), " " (Stub), " " (Mirror), " " (Frost), " " (Vent), Windows, Complete, " 2 Lights, " Small Lights, " Opera, " Panel Backs, Base and Moulding, Picture Moulding, D. R. Wainscot, Beam Ceiling, Shelving, Shelf Cleat, Hook Strips, Plate Shelf, Hearth Borders, Corner Guards, Pedestals, Panels and Colonnade, Mail Chute, Drum Board, Dressers, Pantry, " Kitchen, Wardrobes, Buffets, Linen Closets, Drawers, Broom Closet,

MASONRY
Practical Information on Materials and Latest Construction Methods



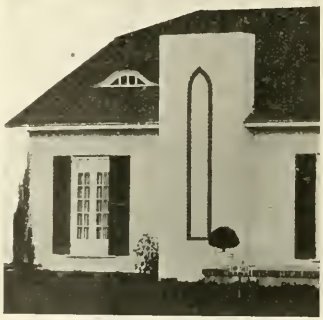
Correct Building of Chimneys and Flues

By FRANKLIN H. WENTWORTH

IN connection with the construction of chimneys, and with a view to reducing the fire hazard, it is urged that the following recommendations be observed in chimney and flue construction.

Build all chimneys from the ground up. None of their weight should be carried by anything except their proper foundations. Foundations should be at least 12 inches wider all around than the area of the chimney and be started well below the frost line.

No chimney should be started or built upon any floor or beam of wood. When a chimney is to be cut off below, in whole or part, it should be entirely supported by brick or stone work, or steel construction, properly erected from the ground up. The practice of supporting chimneys or flues on wooden or iron brackets, or iron stirrups, however carefully devised, is hazardous. A small fire around the base from any cause may drop the flue and allow draft for rapid spread of fire.



Artistic Chimney of Stucco and Brick



Beauty in Proper Use of Brick

Build all chimneys to a point at least 3 feet above flat roofs, and 2 feet above the ridge of peaked roofs.

Under no circumstances should the brick work of the chimney be extended out over the roof by the projection of the course of brick nearest to it. Such a shoulder or overhanging projection will inevitably cause cracks in the chimney in case the chimney settles, the roof in such event lifting the upper portion by means of the overhang, or shoulder, and causing a crack at the most dangerous of all places. The chimney should be carried up of uniform thickness to the top, copper flashing being relied upon to prevent leaks at the joint with the roof.

It is best to have the wall no less than eight inches in thickness, and use only cement mortar up to the first floor and above the roof line.

Chimneys with but 4-inch exterior walls are commonly permitted, and if lined with fire clay are reasonably safe, but they frequently crack and are also easily chilled, which causes a bad draft. Where fireplaces are built of stone, the minimum thickness of the wall should be 12 inches.

The upper part of chimney walls may be only four inches in thickness,



Cast Stone Used to Advantage

from a point at least six inches above the roof to the top of chimney, provided the chimney be capped with terra cotta, stone or cement, or the bricks are carefully bonded or anchored together.

The best coping is a three-inch bluestone, and it is important to see that the holes cut in the capstone correspond in size with the flues, otherwise shoulders will be formed and the draft of the flue interfered with.

In brick buildings the walls of buildings when not less than 13 inches in thickness may form part of chimney or flue. In no case should a chimneys or flue be corbeled out more than 3 inches from the wall, and in all cases the corbeling should consist of at least five courses of brick. Flues in party walls should not extend beyond the center of said walls.

Build all chimneys large enough to give a separate flue for each fire, using fire clay or terra-cotta tile linings at least one inch in thickness.

The fire clay lining is not subject to disintegration by any of the ordinary flue gases.

The lining should be put in as the flue is constructed, using great care to see that the joints in same are carefully made.

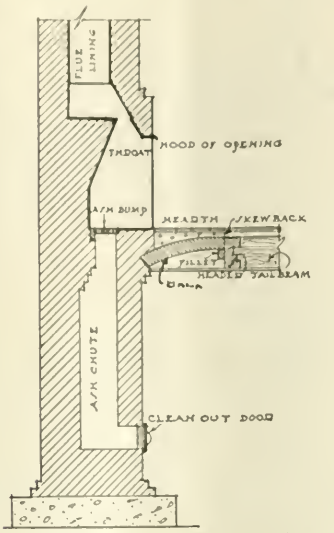
When two or more separate flues are provided in chimney, the division walls between flues may be only four inches in thickness.

Two connections to a single flue will result in fire from one communicating to the opening of the other, and thousands of fires have originated in this manner.

Flues in throat capacity should not be less than eight inches square on the inside, and for fireplaces in which wood is to be used they should be eight by twelve inches (or better, 12x12 inches) in the clear. A good rule is to make the flue size not less than one-tenth the area of the fireplace opening. Green or unseasoned firewood will require a flue of this size to insure a good draft and prevent smoking. The furnace flue should also be not less than eight by twelve inches in any case.

Be careful to see that the flues are properly built. Faults cannot be remedied afterwards. All flues should be as nearly vertical as possible.

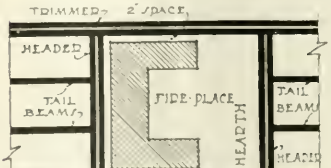
Masons are often careless about lining the flue even where the specifications call for it, and are apt to omit it until they get to the straight part of the flue. This makes the flue dangerous at its hottest point, near



Section Showing Construction of Fireplace

the fireplace, especially if it be surrounded by only four inches of brickwork. Make sure that the flue lining is carried up from the throat of the fireplace.

Where flue linings are not provided, be careful to see that all joints are struck smooth on the inside, and that projections of bricks or mortar are not allowed, and also that no pargeting nor plastering of the inside of the flue is permitted under any circumstances. The plastering is liable



Plan Showing Framing around Fireplace

to fall afterward under the influence of heat and rain and not only stop up the flue, but tear out the plaster between the joints of the bricks. The flue lining will prove the cheapest in the end, for it will maintain a smooth throat and thus discourage nest building by chimney swallows.

All flues in every building should be properly cleaned and all rubbish removed, and the flues left smooth on the inside upon the completion of the building.

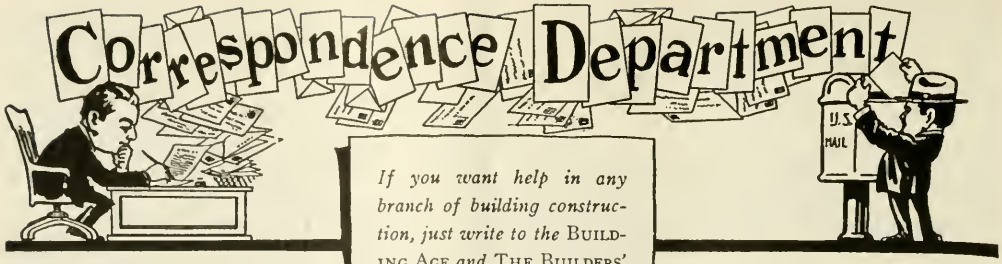
Do not run floor joists or other woodwork into chimneys or flues nor allow wood casing, lathing or furring within two inches of chimneys. All spaces between the chimney and the wooden beams should be solidly filled with mortar, mineral wool or other incombustible material.

Where the chimney breast over the fireplace or mantel is furred out and finished with lath and plaster, only metal lath should be used. If the mantel is of wood, it should not project far enough to be blistered or ignited. Care should be exercised in its selection.

All floor timbers should be "trimmed" clear of the hearths and brick work of the chimney, so as not to be in contact with it at any point.

This is easily secured by "header" beams, carried in front of the fireplace and at least twenty inches from the chimney breast, supported by the "trimmer" beams, which enter the wall on each side of the chimney, as shown in the illustration. These should not approach the side of the chimney closer than four inches. The intervening "tail" beams are mortised into the header. Where more than three tail beams are framed into the header, however, it should be supported in iron stirrups by which the weight is carried on the trimmer beams without mortising into them by "tenon and tusk" joints, which sacrifice material and carrying capacity. In this way the floor beams are free of contact with chimney flues. All hearths should be laid on trimmer arches of brick or a reinforced concrete slab carried across from the chimney breast to the header beam, so that the hearth shall not rest upon or near wooden beams in any case. The length of trimmer arches should not be less than the width of the chimney breasts nor their width less than 20 inches in any case measured from the face of the chimney breasts.

Line fireplaces with fire brick or cast iron.



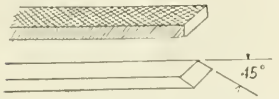
If you want help in any branch of building construction, just write to the BUILDING AGE *and* THE BUILDERS' JOURNAL *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Wood Worker's Chisel From Worn File

FILES of square or rectangular cross-section, when worn are ordinarily discarded as worthless; yet they may be made into another valuable new tool, namely, a wood worker's chisel by the simple operations as follows:

1. Grind teeth off surface of old file on emery wheel.



2. Heat file to a cherry red; then allow it to cool in atmosphere. The file is originally glass-hard and too brittle for the purpose of a chisel; this treatment is therefore necessary to give it the proper temper.

3. Grind bevel for chisel on emery wheel; take caution against "burning."

4. After bevel is obtained, grind cutting edge on oil stone.

5. Place the tang end of the file in a turned wood handle with brass ferrule.

The result is a very good chisel of good quality and temper for wood working. See illustration. **C. Nye.**

Water Conducted Over A High Ridge

OCCASIONALLY the carpenter fails to visualize his complete work in the making, and when the work is finished finds himself confronted with an awkward or unseemly result. The illustration Fig. 1, shows a not infrequent situation caused by such a failure; an extension has been built up against the side of a building, and the comb or ridge is so high that it will scarcely finish up under the eave of the main building. If the owner wants all the water from the main roof conducted to the left for cistern or other purposes, a problem is encountered.

The situation could be handled very nicely with an ordinary roof gutter, but in this instance that was not satisfactory to the owner; he would not allow the necessary shingles taken up from a good roof, and would not stand for the dirt and litter caused by their removal. An eave trough could have been hung the full length of the eave if the comb of the lower building had been cut down to accommodate it, but this would have made an ugly piece of work, it necessarily would have had to be lined with metal inviting leakage and affording a catch-all for leaves and rubbish which would have eventually resulted in rusting out the trough, so the following plan was used.

An eave trough of suitable size was hung in the usual manner, extending as near to the comb as its beveled end piece

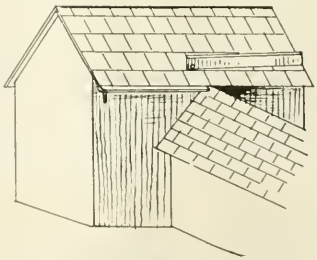


Figure 1

(made to fit the roof pitch) would allow; then a square cornered flash, Fig. 2, was inserted under the first row of shingles above the eave course, this length being given a slight pitch toward the hanging trough and extending some inches over the end of it to insure all the water running into it and not being blown to the back, or over the trough in case of a high wind.

Cut or punch a hole or two in the end corner of the flash (as shown in Fig. 1) so that when a considerable body of water is carried down to the trough, the water will have a chance to spread over the roof, and not depending to have all of it shoot out of the flash end, in one stream.

Eave trough is made in lengths of 10 ft. and when these sections are of a size large enough to flatten on the back for the apron "Y" Fig. 2, and also provide the beaded front from 2 to 3 inches high, they will be found convenient to use from

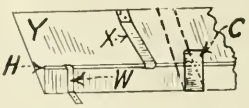


Figure 2

the fact that the bead will interlock and telescope for the lap readily, if needed, when it takes two or more sections to reach the gable end.

For the sake of explanation the sketch is somewhat exaggerated, as the gutters show too prominently. They should be as close together as it is possible to get them so that an awkward break is avoided.

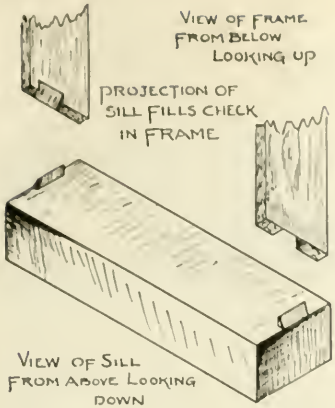
When large eave trough (6 or 7 in.) is not available for this purpose flat galvanized iron strips can be cut, a stiff finish, H, Fig. 2, can be formed by folding the metal double on one edge after which it can be formed into the flash by bending up the front with tongs or over a plank; when more than ten feet of the flat edged flashing is required, connection of another piece or length to reach the gable is shown at C, Fig. 2.

The folded part of edge is sheaved in width of the lap, at which point the sheaved folded edge will abutt the first section, then the extension C made by the sheaving can be folded down over the first length.

As a precaution against this flashes being bent or broken under the weight of snow and ice, roof strips as shown at X should engage the front bead or edge of the flashing and be nailed back upon the roof.

A cleat W may be used at the bottom to stiffen the gutter and hold the corner down solid and smooth.

The flashing front should be no higher than is absolutely necessary to carry the water; then it probably will not show at all from the ground.—**L. S. Bonbrake.**



Securing Door Frames to Concrete Sills

I AM sure the method of holding a door frame in place as shown below when concrete sills are used will be interesting to many of your readers.

The check is cut in the jambs as indicated and then the frame is set in place. When the sill is made the mortar is pressed into the cavities of the jambs and when this sets the frame is held firmly in position.

The advantage of the sloping lug is that moisture will not collect between the sill and frame.

I have been using this method for some time and the frames stay where they are placed.

D. W. Daley.

Ornamental Shingling For Plain Walls

THE severity of a plain expanse of shingled wall can be relieved by "working in" an ornamental design executed with plain shingles of random widths.

In doing this work, the very best grades of shingles should be used, laid with grain tipping outward and downward so as to conduct water outward should cracks or checks develop in later years.

Also, butts should be clean-cut, true and smooth, joints fit perfectly and "line up" straight away from a common center like spokes in a wheel.

The final appearance of any shingled wall is very much improved by smooth, straight laid butts, close fitting joints and perfect surfaces. Perhaps no other exterior finish suffers more at the hands of incompetent labor than shingling and more so unnecessarily for the very best effects obtainable with shingles can be secured with ordinary skillful workmen.

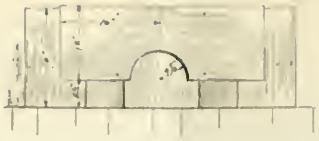


Figure 1

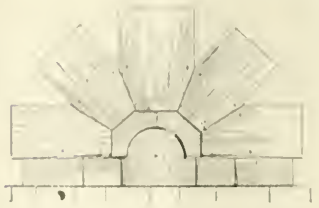


Figure 2

Figure 1 shows the first step toward working in this design. Two good 12" shingles are tacked on lightly, compasses set at 4½" and the first circle struck. Take them off and saw perfectly to this struck line, put 'em back with nails in same holes and then nail thoroughly and this completes our figure one.



Figure 3

Figure 2 shows how second and all succeeding circles are struck. The dotted line shows course line struck on a radius of 9" upon the two 12" shingles forming the first circle course. Fit these shingles forming this second course as shown, allowing the butts to extend below the dotted line; now strike this 9" radi line, take off and saw and replace as previously directed and so proceed until the design has attained the desired proportion, Figure 3, remembering it will look better too small, rather than too large—do not try to make it a main feature. Now bring up the straight, regular courses and terminate them upon this design, in a circle to correspond with the work in place

C. A. Doner.

Squaring the Sides of Excavation

THE outline for a basement or other excavation can be quickly squared, not by driving a single stake at the four corners, but by setting two at each corner, one on a line with each contemplated side. In this way the cord can be run past the corner, and when once square, there is no danger of loosening the stakes when digging.

The photo shows a typical method. Here stakes have been set, two at each corner and several feet from the sides of the excavation. Accurate work was accomplished by shifting one of the stakes at each corner until a line stretched diagonally from one corner to the other opposite, exactly equalled in length, one stretched from the other two

Once the lines have been determined, the intersections of the lines at each corner is then taken as the true corner. A plumb dropped from the intersection gives the desired information all of the way down and it is easy to tell whether the walls are being undermined or run in at the bottom.

The use of one long line can be obtained without cutting, by tying one end to one of the stakes and then running it first to the next back around the other stake in line with the next wall, and so on back again to the first stake.

Dale Van Horn.





Legal Department

APPLYING the mechanics' lien law of Pennsylvania the Supreme Court of that commonwealth recently said in the case of Dyer v. Wallace, 107 Atlantic Reporter, 754:

When are Pennsylvania Architects Entitled to Mechanics' Liens?

"The services of an architect in preparing plans cannot be made the subject of a mechanic's lien . . . except in connection with other services rendered in the construction of the building. . . A construction of the act of June 1, 1901 (P. L. 454), that would extend its benefits to an architect, merely for preparing plans, would render it invalid as a special law for the extension of liens, or as changing the method for the collection of debts, in contravention of section 7 of article 3 of the Constitution of 1874. . . .

"A mechanic's lien can be sustained only for work done or materials furnished, and not for unliquidated damages for breach of contract."

It was decided in this case that plaintiff, an architect, who had been engaged to supervise the construction of a manufacturing plant for 10 per cent. of its total cost, and who, before the work was completed, was discharged, might file a lien against the plant for the value of the work actually done, coupled with an averment that full performance of the contract had been prevented by the owner.

AN interesting decision of the California District Court of Appeal, handed down in the case of Harris vs. Central Union High School District, 188 Pacific Reporter, 617, shows that where a public board has definitely accepted an architect's plans and specifications, it can not afterwards revoke the acceptance without liability to the architect for his compensation.

A Binding Acceptance of An Architect's Work

Defendant school district's board of trustees invited architects to furnish plans and specifications in detail for a proposed addition to a high school building, stating in the notice that the board would award to the architect whose plans were adopted a specified premium and compensation. On considering the plans and specifications submitted, the board accepted those submitted by plaintiff "when modified and changed to the satisfaction of the board." Afterward the board purported to rescind its action in accepting plaintiff's plans and specifications. But the court approves a finding of the trial judge that there was an acceptance of plaintiff's work, entitling him to be paid the agreed compensation. Concluding its opinion the District Court of Appeal says:

"We do not doubt that the board of trustees of a school district, having authority to contract for the construction of a school building, may, in making its contract with the architect or with the contractor, reserve the right to make alterations during the progress of the work, so long as the general plan of the building is not changed. That appears to be the kind of reservation intended in the present case, and this was not inconsistent with a complete acceptance of the proposed plans and specifications."

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age and The Builders' Journal, 920 Broadway, New York City.

THE decision of the West Virginia Supreme Court of Appeals handed down in the late case of Parker Paint & Wall Paper Co. v. Local Union No. 813, (105 S. E. 911) will prove to be a very important judicial precedent on the subject of improper picketing methods adopted by trades unions against employers and persons with whom the employers have contracts.

Unlawful Methods of Building Trades Unions

"It is not clear just what reasons dictated the acts complained of in the bill. If for the purpose of compelling plaintiff to withdraw from membership in the Master Painters, it is unlawful. Plaintiff is as free to join an organization for the lawful furtherance and protection of its affairs as are the members of the Local Union No. 813 to become members of that organization, designed for their protection. If for the purpose of preventing a member of the Master Painters from laboring with his hands in performing his own contracts, it is unlawful. A man's labor is his most sacred asset. It is often his only capital, and as long as he exerts it without injury to others government will protect him. A government which imposes taxes and other public duties, even going so far as to demand life for its defense, and which will not protect its subjects in the 'enjoyment of life and liberty with the means of acquiring property and of pursuing and obtaining happiness and safety,' is not worthy of the name of government, nor of the support of its subjects."

In the West Virginia case, differences arose between members of the Master Painters' Association at Huntington and members of a journeymen's local. Plaintiff, a corporate master painter, and the union accordingly fell out, and the union undertook to carry its point by interfering with plaintiff's contracts.

It is found by the court that defendant and its members caused plaintiff to lose contracts by picketing the places of business where plaintiff's employees were at work, etc. The following excerpts are taken from the

opinion of the Supreme Court of Appeals, upholding plaintiff's right to injunction against defendants:

"There can be no question of the right of the defendants to form a union for their mutual protection and advantage, and enlarge their union by inducing others to join for this legitimate and proper object; but there can be no question, on the other hand, that this right must be so used as not wantonly to conflict with the rights of others. The same is true of the Master Painters' organization. . . If one person wantonly or maliciously, whether for his own benefit or not, induces a person to violate his contract with a third person to the injury of that third person, an action will lie. . . The bannering of the 5 & 10 Cent Store, charging it with being unfair to union labor, and unfair to union painters, could be for the purpose only of causing that store to break its contract with plaintiff. . . .

A DECISION of the Texas Court of Civil Appeals will serve to remind architects and engineers who have dealings with public corporations, church and fraternal organizations, etc., of the importance of ascertaining the full authority of one or more members of a building committee who pretend to have authority to contract on the part of their corporation or organization.

Authority of Members of Building Committees

In this case—Allen vs. Grand Lodge of Colored Knights of Pythias of Texas, 221 Southwestern Reporter, 675—it was held that defendant organization was not bound by a contract purported to have been entered into on its part by a subcommittee of its building commission. In denying plaintiff's right to recover on his claim for additional work performed at the instance of the subcommittee, the Court of Civil Appeals said:

"If the plaintiff was entitled to recover anything in this case under his pleadings, it was upon a verbal contract with the agents of the Grand Lodge. It is not pretended that he made any contract with the lodge itself, but that the contract was made by its authorized agents. The right to contract was vested by the Grand Lodge in a commission, consisting of six members.

"It is not pretended that the contract sued on was made by the commission, acting as a body. It is insisted that a subcommittee made the contract with plaintiff. The Grand Lodge made the six commissioners its joint agents. Authority conferred on two or more to represent their principal in the transaction of business of a private nature it ordinarily will be presumed was conferred upon all from considerations of a personal nature, and in order to derive the benefit of their combined experience, discretion, or ability. Such business usually can be performed only jointly unless an intent appears that it may otherwise be executed."

Unsatisfactory Work Done by Subcontractor

IN March, 1917, I contracted to build a bungalow for $2,340," writes a North Dakota contractor and builder. "The work was done under plans and specifications furnished by the owner. I sublet the foundation and basement floor to a cement man. The house was completed, accepted and occupied in September, 1917. The last payment on the price was made one year later. Some time in 1918 a patch of the cement floor heaved up and crumbled, having the appearance of air-slacked lime. I notified the subcontractor and he took out the bad floor and put in a new floor. In March, 1920, the owner's wife desired some changes made in the house. I did this work and charged $130, but the owner refuses to settle until I again have the cellar floor repaired; it appearing that the floor had again crumbled. The subcontractor refuses to repair the floor, claiming that there is alkali, or some other chemical, in the ground which destroys the cement. Now, what will be the square thing for me to do?"

If the floor can be repaired at an expense less than it will cost to sue the owner or the subcontractor, or both, we would advise fixing the floor, on condition that the owner give a final release of all further responsibility on account of the building. It may be that the subcontractor, in the same spirit of fairness, will stand one-half the expense of the repairs. These suggestions are made with a view to an amicable adjustment without litigation.

The legal principles governing the case seem to be clear, leaving nothing but questions of fact to be solved should litigation follow.

Of course, any defect in constructing or repairing the cement floor constitutes no defense to the owner's liability for the additional work covered by the bill the contractor is now seeking to collect.

But, if the floor was not constructed or repaired in a good and workmanlike manner, the owner can counterclaim damages sustained by him. The amount of such damages would be the cost of putting the floor in proper condition.

The contractor is liable for any failure on the subcontractor's part to construct or repair the cement floor properly, just the same as if the work had been done by the contractor himself.

So, the decisive question is whether the work was properly done. If so, the owner's suit or counterclaim for damages must fail. If not, the owner is entitled to recover. In that case, the contractor's only recourse is to come back on the subcontractor.

It seems that the owner never disclosed until late in 1921 that he made any claim that the floor had again proved to be defective, although the floor had been repaired some three years previously and although the contractor had been employed in the meantime to do other work on the building. These circumstances will have strong tendency to show that the owner's present claim is unjust. In any event, the burden will be on him to prove that the floor was not constructed and repaired in a workmanlike manner. That the work was properly done can be established on the part of the contractor by showing that proper materials were used and applied in proper manner.

But litigation involves time, expense and worry, and that is why we suggest that a spirit of fairness may lead all three parties to reach a compromise which will leave all of them in better condition than if suit were prosecuted.

"The proof does, indeed, show that at that time conditions were such not only in Little Rock, but everywhere, that labor as a whole was inefficient, but it does not show that efficient labor, but skilled and unskilled, could not be obtained at the prevailing schedule of prices.

"The proof also shows beyond a doubt that this lowering of the efficiency of labor began more than a year before this contract was entered into, and if it increased after that time it was only in degree.

"At any rate, we think that under the contract the selection of efficient labor was one of the things that appellants undertook, and it was not exempted from its guaranty on account of losses from that cause.

"The interpretation of the contract must be drawn from its own language and the peculiar circumstances of the case. It is therefore unnecessary to cite authorities announcing general principles of law on this subject."

ONE of the heaviest penalties yet imposed on an employer for violation of the Workmen's Compensation Law in New York State was that of the case of a builder of Queens, Long Island, N. Y. He was sentenced recently to sixty days in jail for failing to provide adequate insurance for his employees, quite a costly lesson.

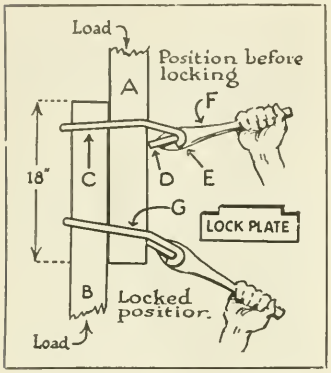
Violation of Compensation Law

An inspector of the State Industrial Commission of New York made the complaint against this contractor. It would seem that builders would take care of this matter for their own financial interest if not for humanitarian reasons.

WHAT'S NEW



New Materials and Equipment that Keep Your Work Up to Date



Useful Timber Clamps

TO eliminate spliced joints, nailing, sawing and wedging, in the erection of scaffolds and forms for concrete work, the clamp pictured above will be found very useful, as it is low in price, easily applied and easily taken down. These clamps are made by the Schenk Timber Clamp Corporation of 501 Fifth Avenue, New York City.

They are made in sizes to fit 2x4, 3x4, 4x4, and 2x6 timbers. To operate, first place two timbers A and B together in such a manner that they will have an overlap of at least 18 inches and with the *direction* of their loads indicated by the arrows; namely, with the load on *A* downward and on *B* upward.

Next, place the steel loop *C* of your Schenk Clamp around both timbers and place the two niches in lock-plate *D* into the hooks *F* on both sides of the loop as shown in the illustration.

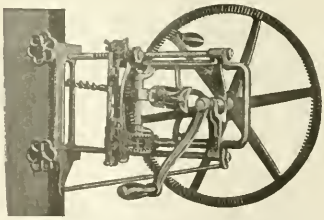
Next, insert the lock-plate between the jaws of the wrench *F* and pull downward. This locks the clamp securely and fastens the timbers together in such a manner that the joint is the strongest part of the structure. The greater the downward and upward load on the two timbers the tighter the grip of the Schenk Clamp. This can be seen at *G*, which shows the clamp in the locked position.

Door Mortiser

MAKING the mortises for door locks is no hard job to the experienced man, but it takes time. With the simple machine pictured here, the complete mortise ready for the lock can be made in 2½ minutes without the use of brace and bit or chisel.

This machine, which is made by the Enterprise Mortise Machine Company of Columbus, Ohio, is simply operated. To operate it is simply clamped to the door, etc., which is to be mortised and as it is adjustable, different sized mortises from 1½ in. to 6 in. long and any depth to 3¾ in. with all size bits from 1¼ in. to 1 in. can be made.

The complete mortise is made without moving the machine after it is set to the size of the mortise required.



Turning the main gear runs the bit at a high speed and turns the oscillating screw that carries the bit up and down through the mortise; the rotation of the oscillating screw is reversed at any point automatically by the bit arm striking a pin at top and bottom of movement. These pins are moved together or apart by turning one thumb nut at top of mortiser, thereby changing the length of mortise as desired; the movement of bar that carries these pins imparts a rotation movement to the feed spiral and causes the bit to be fed forward into the wood at top and bottom of mortise.

This feature locks the bit so it can not draw in when it strikes a hole or soft wood, nor push back when it strikes a dowel pin or knot.

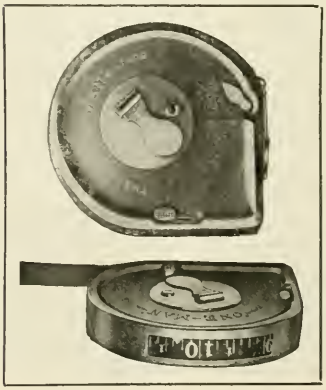
The "One Man" Tape

THE ordinary steel tape has been replaced by a practical and more useful steel tape, the "One Man" Tape, which, as the name suggests, can be easily and accurately operated by a single person. It is made by the A. S. Aloe Company of St. Louis, Mo.

This type of a tape has many advantages over the old style tape for obtaining accuracy in readings on both inside and outside measurements. The grasping cam lock retains the measurements after they are taken and the winding drums inside the casing are improved so as to present slack or back-slack in the line. The cases are formed from solid brass, heavily nickeled, insuring the tape for long wear under hard usage.

All projecting parts on the case are so arranged as to fold and lock in place, leaving the surface of the case free from sharp points and edges that would scratch the hands or tear the pockets.

Anyone who has experienced the trouble of obtaining measurements single handed with an ordinary tape knows the difficulty only two well and we do not need to dwell on them. This new invention, therefore, will be truly welcome.





Efficient Service—

NATIONAL GARAGE DOOR sets are built right—Skillfully designed and carefully constructed they stand, ever ready to give 100% of Real National Service.

These garage door sets work as freely and as easily as any house door—simply push and the doors are open; a slight pull and the doors are closed.

There is absolutely no binding or friction, and the doors are adjustable in case of swelling or raising of cement floor.

National service is the best service you can offer your customer.

Send for our garage plan booklet "F" and give dealer's name.

NATIONAL MANUFACTURING CO.

STERLING :-: :-: ILLINOIS

National

Slate Roofing

SOME very practical information on the use of slate for roofs is contained in a booklet just issued by the Vendor Slate Co. of Easton, Pa.

The information is given on selection, estimating and specifying slate roofing, together with detailed drawings and directions showing the proper way of laying slate so as to obtain different effects.

This interesting book of twenty-four pages will be sent to any builder interested.

How to Apply Hardware

SEVERAL useful booklets have just been issued by The Stanley Works, New Britain, Conn., showing by means of detail drawings, the proper application of butts, bolts, blind and shutter hardware, garage hardware, screen and storm sash hardware, etc.

These booklets will be sent to any of our readers who will write for same. They are very well illustrated and contain some very valuable data.

Steel Toilet Partitions

INSTEAD of marble or slate, toilet partitions are now being made of steel. They are sanitary, easily kept clean, nonbreakable, have an excellent appearance, are easily erected and moderate in cost. Any builder who has a school job or other public building to construct will do well to have the new catalogue issued by the Hart and Hutchinson Co. of New Britain, Conn., as it contains some valuable information about such partitions.

Brick Houses

A SUPPLEMENT to "Brick for the Average Man's Home" has just been issued by the Common Brick Manufacturers Assn. of America, Cleveland, Ohio.

This supplement contains twenty designs of artistic brick houses and is sent free to anyone having the earlier book "Brick for the Average Man's Home."

Floor plans are given for each house giving dimensions for all the rooms.

Built-In Ironing Board

THE builder who desires to make a success will be on the lookout for different appliances that will please his customers.

A device of this kind is described in a circular just sent out by the National Mill & Lumber Company, 2 Rector Street, New York. It describes their National Built-In Ironing Board, which comes in a cabinet containing the folding iron board with separate sleeve board and three shelves for laundry supplies.

This is a built-in device that is installed while the kitchen is being built; and they also have a similar device to install in kitchens already built.

As there is a useful hint here, it is worth while sending for this circular.

Useful Catalogs

ON this page we give short descriptions of some very interesting catalogs, etc., that have just been issued by different manufacturers.

They will be sent free on application to any of our readers who are interested, but should you prefer to write us, give the date of this issue and title of the catalog desired, and we will have them sent to you.

Wiring Device

A RATHER interesting catalogue has just been issued by the Arrow Electric Company of Hartford, Conn., describing their complete line of wiring devices for modern homes and other buildings.

The builder should be posted on all sorts of electrical equipment and in his building he should provide enough outlets and proper wiring so that many electrical appliances can be readily attached.

Paints and Varnishes

SOME very useful information is given in the descriptive catalogue issued by John Lucas & Co., Inc., of Philadelphia, Pa. This interesting catalogue of 90 pages will be sent to any of our readers who are interested.

Garage Hardware

IN an interesting catalogue of sixteen pages, issued by the McKinney Mfg. Co. of Pittsburgh, Pa., they describe the complete hardware for various types of garage doors—double swinging, sliding and folding, also combinations of the above.

A copy of this booklet in your files may help you solve a troublesome garage door problem put to you by one of your customers.

It is best to be informed as to what can be obtained in this line and you can receive a copy of this catalogue by asking for it.

About Saws

SOME very interesting information is contained in the booklets published by E. C. Atkins & Co., Inc., of Indianapolis, Ind.

Among these, we may mention particularly the ones on cross cut saws, saw sense, and the hack saw chart,—the latter showing the right blade to select for every kind of work and metal.

These interesting booklets and chart will be sent to any reader interested.

Builders Hoists

A RATHER interesting catalogue of sixteen pages has just been published by the Brown Clutch Co. of Sandusky, Ohio. It lists the different hoists they manufacture from the single drum hoist up to large double drum hoists. Some very useful information is contained in this interesting catalogue.

Waterproofing

VALUABLE indeed is the book of specifications on the subject of waterproofing, dampproofing, oil proofing, floor hardeners and protective finishes for concrete surfaces that has just been issued by the Truesdon Laboratories, Detroit, Mich.

The book contains fifty-two separate specifications of methods and materials of properly coating concrete work, also steel and wood work.

It is a valuable hand book and will be sent to any of our readers who wish to guard against troubles from dampness.

Home Water Systems

IN localities where water under pressure is not obtainable, a house may be supplied with fresh running water direct from the well or cistern, by the use of an automatic pump.

An interesting catalogue has just been issued by F. E. Myers & Bro. Co., of Ashland, Ohio, describing their direct water system. They have a complete automatic system operated by electric motor with a sufficient capacity to pump directly against the faucets such as are contained in an ordinary residence. The opening of any faucet automatically starts the pump.

This interesting catalogue will be sent to any of our readers who may be interested in installing a water system.

Artistic Mantels

NOTHING adds so much to the charm of a well designed room as a properly proportioned open fireplace and mantel. It will therefore interest builders to secure a copy of the new catalog of the King Mantel and Furniture Co., Gay St., Knoxville, Tenn. It contains many period and modern designs of mantels and fireplace fixtures, besides some very useful data. It certainly is worth while sending for.

Electrical Outlets

IN building the modern home, particular attention should be paid to the electrical wiring, both for present and future use.

Sufficient outlets should be provided in all the different rooms for attaching various electrical appliances. A most interesting catalogue on these wiring devices has just been issued by the Bryant Electric Co. of Bridgeport, Conn., and builders would do well to have a copy so as to acquaint themselves with the newest things in this line.



Residence in Country Club District, Kansas City, Mo. Redwood Siding, painted white. Built by the J. C. Nichols Investment Co. Edward W. Tanner, Architect.

Residence and Garage at Belmont, Mass. Redwood Siding, painted white. Built by George Umgren. Grosse Lord, Architect.

Residence at Des Moines, Iowa. Redwood 8-inch Colonial Siding, painted white

Residence at Highland Park, Ill. Redwood Special Sawn Shingles, painted white. Robert Seyfarth, Architect.

Homes of Redwood from Missouri to Massachusetts

REDWOOD'S resistance to rot and its consequent lower annual cost for repairs and repainting give the builder the strongest selling point. For every unit and part of the exterior of a frame house you can secure T P L Co. Redwood lumber and milled products to meet all requirements of design and construction.

During the growth of Redwood every fibre is permeated with a *natural*, odorless preservative which permanently protects it against all forms of rot and decay.

Containing no pitch or other highly inflammable resinous compounds, Redwood is slow burning—reduces the fire hazard wherever used. A uniform cell structure free from pitch or other substances gives Redwood a remarkably good painting surface,

The high proportion of clear lumber, its soft texture and good wood-working qualities keep waste at a minimum when you use Redwood.

You may be surprised to know that the price of Redwood compares favorably with the prices asked for wood that cannot compare with Redwood in resistance to rot, high percentage of clear lumber and for freedom from warping, swelling and shrinking.

Use these selling points and you will find that using Redwood you can get better prices.

Redwood should be specified for

Exterior Construction

Including—Colonial siding clapboards, shingles, door and window frames—gutters, eaves, water tables and mudsills, porch rail, balusters and columns, mouldings and lattice, picket and fencing, pergolas and greenhouses.

Interior Finish

Natural, stained or painted Wood block floors.

Industrial Uses

Tanks and vats for water, chemicals and oil, factory roofs and gutters—wood block flooring.

Wood Specialties

Such as—Caskets and burial boxes, incubators and ice-cream cabinets, cigar and candy boxes—furniture manufacturing, etc.

Railroad Uses

Such as—Railroad ties and tunnel timbers—signal wire conduits and water tanks, car siding and roofing.

Farm and Dairy Uses

Such as—Silos, tanks and troughs, hog feeders and implement sheds, wood block floors, etc.

For the convenience of builders and architects we have prepared our "Construction Digest" and our "Engineering Digest." They will be sent free on request by either our New York or Chicago office. Write for them.

CHICAGO — 2070 McCormick Bldg. — THE PACIFIC LUMBER CO. of Illinois

NEW YORK — 832 No. 40 Rector St. Bldg.

SAN FRANCISCO — 311 California St.

LOS ANGELES — Central Bldg., 6th and Main Sts. — THE PACIFIC LUMBER CO.

P T L C

The Pacific Lumber Co.

Redwood

The Largest Manufacturers and Distributors of California Redwood

"The Western wood for Eastern homes"



PAINTING

Practical Points of Interest to the Builder

Saving Time When Painting

By DALE VAN HORN

NO other attention quite so enhances the value and appearance of the home buildings as a good coat of paint. There are but few who do not realize this and yet, knowing this to be true, many fail to apply the brush as often as it should be applied.

One reason for the wanton neglect of some cases is the fact that some do not go about a painting job in the right way. Viewed with apprehension at the start, it looms up bigger than it really is, but when a few ideas for saving time and labor are put into practice, an apparently difficult job dwindles into a commonplace chore and an enjoyable one at that.

Below are described and in the drawings illustrated a few ideas which may be utilized to advantage when painting roofs or other surfaces of buildings. Each one or more may be adapted to any one job.

When leaving off over the noon hour or at night, it is customary to drop the brush in the pail of paint or lay it on a board. Figure one shows a better method. Cut a piece of tin or sheet iron of about the shape of a mower section, but only an inch or so each way. Tack this on to one side of the brush just above the base of the bristles and bend the free end out slightly so that it will slip easily over the edge of the pail. When leaving work for a short time slip this over the rim of the pail. This leaves the bristles immersed in the paint, and prevents bending of the bristles and at the same time keeps the rest of the brush out of the paint. When in use the tin does not interfere in any way with the manipulation of the brush.

Many jobs are done almost entirely from a ladder. A nail driven into the side of the ladder is a handy way to support the paint pail, yet lacks some marks of being entirely satisfactory. On straight siding work a hook such as is shown in figure two may be found superior to the other method of a nail driven in the side of the ladder, or a small shelf on the ladder either. This consists of two small iron rods one quarter of an inch in diameter, one riveted to the other. One end of the horizontal rod is flattened and bent at right angles to the rest, and this is slipped under one edge of one of the siding boards and the hooked end of the brace rod set against the surface lower down. This will readily support a gallon pail full of paint in any condition and has the advantage of being easily placed where desired from time to time and in a jiffy. The hole through the horizontal rod need not be larger than is necessary to take a shingle nail, which can be used for the rivet.

Figure three shows two devices which will come in handy when painting roofs. The question of properly supporting a pail full of paint on a steep roof sometimes seems a big one and it becomes necessary to provide some sort of a support which is easily moved and which will not slip. The support shown consists of a piece of one-inch board ten or twelve inches square. Two six penny nails are driven through the back side, one at each corner, and through the corresponding corners on the front are driven spikes. The difference in the lengths of these two sized nails will more than make up the pitch on an ordinary roof.

In connection with this support, two others somewhat similiar in action should be made for the painter. If the pitch of the roof is slight and the surface dry, which of course, it must be, a pair of rubbers may be all that is necessary to prevent the feet of the painter from slipping. Under other circumstances, however, it becomes necessary to provide secure footing of some sort.

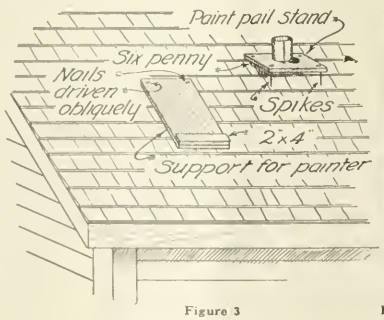


Figure 3

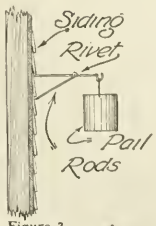


Figure 2



Figure 1

FREE—This Book on Wood Finishing



This book is full of practical information on finishing new floors and trim and refinishing old work of this kind. Written by experts—profusely illustrated—contains color charts—gives covering capacities, etc. We will gladly send it free and postpaid to contractors and builders.

Fill Out and Mail this Coupon

S. C. JOHNSON & SON,
Dept. B.A.-8, Racine, Wis.

Please send me, free and postpaid, your book on Wood Finishing.

Name .....

Address .....

City and State .....

I Buy Varnish from .....



Make Satisfied Customers and Get More Business

Every good job you do helps to get other jobs for you, besides holding your old customers. Quality workmanship and high class materials insure a perfect job. You furnish the quality workmanship and we will furnish the quality material. That combination makes your future success sure.

The use of Johnson's Artistic Interior Finishes insures satisfaction, both with the appearance and wearing quality of your work. The Johnson Line of interior finishes includes Perfectone Undercoat and Enamel—Wood Dye—Paste Wood Filler—Floor and Finishing Varnish—Prepared Wax—Permacote—Wall Finish—and everything necessary for floors, trim and walls.

JOHNSON'S
ARTISTIC INTERIOR FINISHES
JOHNSON'S



BUSINESS GETTING METHODS

Ideas that have worked for others

Desirable Publicity and How Obtained

Interesting Paper Presented at Secretaries Conference of the National Association of Builders' Exchanges

By J. HALE PARDONNER
Secretary the Dayton, O., Builders' Exchange

PUBLICITY in connection with the building game is one of the remedies for the many troubles which confront the builder of today.

The ignorance of the public as to the general conditions pertaining to situations both in material and labor is of such dense character that it is almost impossible for the builder to get across the most fundamental ideas which concern the building public.

In other lines of industry the layman has a fair general knowledge of conditions, such as the coal situation and the railroad situation, but the building industry which ranks among the largest in the country is a black fathomless ocean.

The only remedy for these conditions is the proper kind of persistent publicity. This object is sought very keenly by a few of the different branches of the building industry, among them being the cement industry and the lumber industry, but these are only units in the big system, and it will require concerted effort on the part of the building industry as a whole to attain this object.

The combination of building and real estate is ideal from the publicity standpoint, as the two lines of endeavor are so closely allied that they will work together to their mutual advantage. It has been found that where publicity is carried on by a co-ordinated committee from both the builders and the real estate men that the public in general is greatly benefited, and as a result the builders themselves.

The ideal situation would be to have a real estate board or a committee act in conjunction with the Builders Exchange, appointing a representative on a salary basis to handle this matter. If it is allowed to be carried on by one or two members of each branch independently, it has been found after a time both branches will fall down and the public will lose interest.

It is a situation that requires very skillful handling on the part of advertisers and the person to whom this duty is delegated should have this and nothing else to look after.

The creation of a building and real estate page as a weekly event in one or more of the newspapers of a community, establishing an information bureau to which the prospective builder can go for unbiased information should be carried on.

This page should be conducted so that it contains editorial matter which is absolutely free from any self-advertisement of any individual or firms, and also should contain live news of the day as to the progress of construction of real estate in the vicinity as well as advertisements of firms interested in this work.

Public opinion can be established and sentiment moulded, thereby creating a buying impulse when times are right. Further, many of the unreasonable things to which builders are subjected can be brought to light and cured by an airing in the public eye.

The advantages of publicity are too many and undeniably beneficial for anyone to argue against the use of this means as a furtherance in the development of the industry.

In this state of age of affairs too much stress cannot be laid upon the benefits which are accrued from a logical, consistent and concentrated effort to acquaint the public with the many phases of the building industry with which they are directly connected although in ignorance of this connection.

This is a matter of tense study on the part of special committees, and we would recommend that they be appointed from both real estate boards and builders exchanges in all communities.

> ONE of the most desirable things for any business is proper publicity. Let the public know something about your work and methods.
>
> Co-operative advertising is what is needed, the cost is evenly distributed and all benefit.

YOUR Needs—complete.

If you use sheet metal of any type, we can furnish a product specially adapted to your requirements. We combine good materials with the most approved manufacturing methods.

KEYSTONE
COPPER STEEL

Copper is the anti-toxin for sheet metal rust. Properly proportioned, it puts into sheet metal building products a new measure of endurance and resistance to rust that cannot be attained without its help. Keystone Copper Steel assures more lasting and satisfactory construction. Its use is strictest economy.



Use Apollo-Keystone Galvanized. Shall we send new Weight Cards and Apollo Calendar?

For roofing, siding, gutters, spouting, eaves trough, sheet metal and tin work, use Keystone quality Galvanized Sheets and Roofing Tin Plates. Time and weather prove it best for both builder and owner. Sold by leading metal merchants. Look for the added Keystone.



Write for booklets describing Keystone Copper Steel Sheets, Formed Products, and Terne Plates.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES

Chicago Cincinnati Denver Detroit New Orleans New York Philadelphia Pittsburgh St. Louis

Export Representatives: United States Steel Products Company, New York City

Pacific Coast Representatives: United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle

News, Notes *the* Comment

Lectures on Building Materials

NEW YORK University announces a series of lectures on the geology of commerce and industry.

There will be several lectures on building materials, taking up the subjects of the American building stone industry; the lime and cement industry; brick, tile and associated clay, gypsum and plaster and the various roofing materials.

This interesting series of lectures will be given during the Fall term, on Wednesday evenings at 8 P. M., beginning September 27th.

Any of our readers who are interested can write to the Secretary, New York University, Washington Square, New York, and full information will be sent.

Built-in Kitchenettes

THERE is a large demand today for small apartments and the old time kitchen that was thought to be an absolute necessity has given way to the kitchenette, in the equipment of which some very handy space saving fixtures are employed.

Quite a novel arrangement is a kitchenette consisting of sectional steel cabinets that will fit into small space. These steel cabinets are 18 in. deep, 30 in. wide and 82 in. high, so that they fit into a closet 7 ft. high and less than 2 ft. deep.

One cabinet contains a three burner gas range with broiler in oven with a drawer below and a cabinet above. Another section contains a substantial refrigerator with a cupboard on the top. Above the refrigerator is a draw shelf covered with zinc which forms a small but useful work table when pulled out.

These different steel units can be arranged in different ways so as to make any desired combination. The regular sink is placed either between two units or to the one side if desired and the whole arrangement may then be closed in by folding or sliding doors, an arrangement often desirable at one end of a living room, as when the doors are closed it is entirely out of sight and does not interfere with the appearance of the living room.

In combination with an in-a-door bed it is possible to have an one-room apartment with the conveniences of living room, dining room, kitchen and bedroom. This, in connection with a bathroom and closets for clothes and bed surely makes an "apartmentette."

Book Reviews

The Design of Steel Mill Buildings by Milo S. Ketchum; published by McGraw Hill Book Co., New York. Price $6.

This is the 4th edition of this book. For present edition, the entire book has been rewritten, and in its present shape is a valuable contribution to the designer or architect of structural work. The calculation of stresses is carefully gone into and in natural sequence the design and construction of steel framework is considered. The subject of trusses is carefully gone into and simply explained. Even though it is a short chapter, the one on steel mill erection is replete with some very valuable information. Different specifications and notes on details are given to make the book a rather complete and valuable hand book.

* * *

The American House Edited by Charles J. Keefe; published by the U. P. C. Book Co., 243 W. 39th St., New York. Price $10.00.

This is quite an elaborate book with pages 9″ x 12″ in size, so that illustrations of large size can be used. It is a collection of illustrations of the best type of American Houses and indicates the high standard of our present domestic architecture. Examples of the different various styles has been included and these have been separated in different sections. 219 different plates are shown and everyone is accompanied with a brief description. Both exterior and interior views of the house are shown and it will form a very valuable book for the builder and architect as it abounds with illustrations of the best work. The book is especially well printed on heavy paper and bound.

Good Houses by Russell F. Whitehead architect, published by Weyerhauser Forest Products, St. Paul, Minn. Sent free.

A very attractive and valuable book of 64 pages that contains examples of the different domestic architectural styles. This to most people is the most popular problem that confronts the intending builder. The idea of the book is to help people determine what kind of a house will lend itself best to the site and conform to one's mode of life. The different types of architecture are described as well as the English, Italian, Spanish, Swiss, bungalow types, etc. The book is exceptionally well written and contains some very practical information that was certainly the result of a good deal of study on the part of its author. The illustrations are exceptionally good.

* * *

Modern Plumbing Illustrated by R. M. Starbuck; 407 pages, 6″ x 9″; cloth bound; price, $5.00; published by N. W. Henley Pub. Co., New York.

This is a comprehensive and practical work on the most approved methods of installing plumbers work. It is exceptionally well illustrated and the diagrams in each case have been specially drawn by the author for this book. Practically every method of installing plumbing fixtures has been taken into account. It is a valuable book on the subject and building contractors can read it with a good deal of profit, as they will have a better idea of right methods.

School for Building Mechanics

PRATT Institute announces the opening schedule of evening classes for the Fall Term beginning Thursday evening, September 21, 1922. Classes will be organized for carpenters and other woodworkers for the study of roof framing, stair building and steel square problems under the personal supervision of Mr. R. M. Van Gaasbeek. Circulars of information and application blanks will be mailed to all readers of the BUILDING AGE upon request by addressing Pratt Institute, Grand Avenue, Brooklyn, N. Y.



GROVE PARK INN, ASHEVILLE, N. C.

Would rather do without carpets than
BRASS PIPE

"When I built Grove Park Inn," says Mr. F. L. Seely, President of the Corporation which owns this famous resort hotel "I profited by the mistakes I understood other hotels to have made, and every inch of hot water piping in the Grove Park Inn is Brass. After ten years of service it is exactly like it was the day it was put in.

"And if I were building a cheap commercial hotel instead of Grove Park Inn, the finest resort hotel in the world, I would install Brass hot water lines if I had to go without carpets on the floor, for I have seen the troubles other hotels have had."

Mr. Seely adds that he used Brass pipe in the building of his home also and that he does not believe the equipment "will be any different a hundred years from now than it is today."

"Brass is cheaper because
you pay for it only ONCE"

COPPER & BRASS
RESEARCH ASSOCIATION
25 Broadway - New York

Review of Building Situation

BUILDING statistics for June just published by F. W. Dodge & Co. show that the volume contracts awarded are but little less than that of the record month of May, it being only 5% under the May figure, but 52% increase over that of June 1921. The total of contracts awarded amounts to $343,439,800.

Residential construction still keeps in the lead, in fact, for the six month period of this year, this class of construction accounted for 40% of the total to date and this is 89% ahead of last year's figures. As was to be expected, there is a decline in the amount of contracts awarded but the surprising part is that it was so slight. This indicates continued building activity for the balance of the year.

There has been quite an increase in industrial buildings in all the Eastern States. In the Chicago district, which showed an advance last month in this line of construction, there was a falling off of over 40%.

In the New York district and Middle Atlantic districts there was a substantial increase in the amount for residential construction. In all the other states, there was slight decreases in this line of construction.

As we have passed the first half of this year, it is interesting to know the following figures: Total amount of construction for which contracts awarded for the first six months of this year, amount to $1,690,984,000 which is by far the highest figure for the first half of any year on record, it being 89% greater than the corresponding six month period in 1921. Of this vast sum of money which is being spent for construction this year, $682,663,000 was for residential construction, this being an increase of 89% over that of the corresponding period of 1921.

As pointed out by us, during the past few months, the best sign of the business revival is the demand for business buildings. During this six months period, the sum of $280,329,000 was for business buildings, this being 94% greater than that of last year.

School building is keeping pace with the progress of the times, the sum of $164,641,000 being spent for additional buildings which is 58% greater than that of the corresponding period of 1921. Other lines of construction show equally as great improvement.

The vast amount of residential construction in the Eastern States would seem to have filled all requirements for some time to come, but evidently many more homes are needed and will be erected before things in these sections become normal again. It certainly is a most gratifying sign for the builders of the East to have this amount of work in contemplation.

Record of June, 1922, Building Contracts Awarded

Classification of Buildings	SECTION OF COUNTRY						
	New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$6,529,200	$14,199,400	$8,031,700	$6,809,300	$12,655,000	$3,264,300	$51,488,900
Educational	5,523,600	8,843,000	5,478,500	6,566,200	14,950,700	2,882,700	44,244,700
Hospitals and Institutions	575,000	1,157,900	797,100	1,045,600	1,881,000	150,000	5,606,600
Industrial	3,040,500	4,360,600	2,296,500	5,218,700	4,901,500	459,600	20,277,400
Military and Naval	85,000	4,900	351,400	30,000	.....	50,000	521,300
Public Buildings	78,000	895,000	241,300	148,800	1,057,000	2,300	2,422,400
Public Works and Utilities	6,483,600	6,297,700	7,812,500	13,460,800	22,849,100	1,036,300	57,940,000
Religious and Memorial	1,201,000	2,417,000	1,797,400	1,810,000	3,081,000	312,000	10,618,400
Residential	12,953,400	39,968,500	27,339,000	18,441,300	35,437,000	2,220,000	136,359,200
Social and Recreational	1,830,600	1,238,600	2,227,900	923,200	7,599,600	141,000	13,960,900
Total	$38,299,900	$79,382,600	$56,373,300	$54,453,900	$104,411,900	$10,518,200	$343,439,800

Building Projects Contemplated, June, 1922

Classification of Buildings	SECTION OF COUNTRY						
	New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$6,816,400	$15,992,000	$8,074,300	$6,747,600	$19,452,500	$1,263,100	$58,345,900
Educational	3,828,000	12,289,200	8,057,000	6,304,800	8,201,800	1,174,500	39,855,300
Hospitals and Institutions	985,000	4,617,500	1,739,000	4,307,000	6,252,000	20,000	17,920,500
Industrial	3,127,500	4,074,000	3,627,000	10,766,500	8,631,500	191,500	30,418,000
Military and Naval	95,000	4,000	400,000	75,000	355,000	20,000	949,000
Public Buildings	210,500	7,183,500	194,900	399,800	2,408,500	531,000	10,928,200
Public Works and Utilities	3,830,200	6,861,800	12,893,300	16,888,000	44,770,000	1,951,200	87,194,500
Religious and Memorial	1,551,000	1,559,500	1,612,800	1,918,000	10,721,000	222,000	17,584,300
Residential	16,342,000	141,393,200	33,204,900	25,729,300	53,512,000	3,343,600	273,525,000
Social and Recreational	2,791,500	7,718,000	1,864,000	4,436,200	10,578,600	66,000	27,454,300
Total	$39,577,100	$201,692,700	$71,667,200	$77,572,200	$164,882,900	$8,782,900	$564,175,000

ATKINS
SILVER STEEL SAWS



Straight Back, Skew Back, Old Style or New Improved Perfection Handles

On this page we illustrate four patterns of saws which are liked by many carpenters. If you do not see any that YOU like, write for our Saw Sense Book.

Our trade mark is etched on all Silver Steel Saws and it serves to identify us as progressive saw makers who apply skill, art and science in the production of them.

The methods we employ in the manufacture of Silver Steel Saws is your assurance of obtaining "The Finest on Earth," in saws at a fair price.

If you want service you can get it in Atkins Saws, the Saws that you can count on to do your work well, Saws that cut clean, fast and smooth, Saws that give you the most service with less filing.

Enclose a quarter for nail apron, souvenir lead pencil and Standard Time Book

E.C. ATKINS & CO.

ESTABLISHED 1857 THE SILVER STEEL SAW PEOPLE

Home Office and Factory, INDIANAPOLIS, INDIANA

Canadian Factory, Hamilton Ontario

Machine Knife Factory, Lancaster N.Y.

Branches Carrying Complete Stocks In The Following Cities:

Atlanta	New Orleans	Seattle
Memphis	New York City	Paris, France
Chicago	Portland, Ore.	Sydney, N. S. W.
Minneapolis	San Francisco	Vancouver, B.C.

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	June 27	July 27
LONG LEAF YELLOW PINE—		
B. and Better Edge Grain Flooring, 13/16x2¼" Face...	$80.50	$80.00
Dimensions, S1S1E, No. 1 Common, 2x4", 10'.....	39.75	39.75
Timbers, Merchantable, '05, 12x12", 10 to 20'.....	53.00	53.00
B. and Better Ceiling, ½x3¼	45.50	45.50
B. and Better Partition, ¾"x3¼".....	59.00	59.00
B. and Better Finish, 1x4".....	63.00	64.00
No. 1 Common Boards, 1x8".....	47.75	44.00
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13/16x2¼".....	$64.00	$67.00
Roofers, 13/16x5½"	33.50	31.50
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3".....	$75.00	$75.00
No. 1 Clear V. G. Flooring, 1x4".....	77.00	73.00
No. 2 Clear and Better Ceiling, ½x4".....	45.00	45.00
No. 2 Clear and Better Novelty Siding, 1x6".....	52.75	52.75
No. 2 Clear and Better V. G. Stepping.....	89.00	89.00
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M.....	$7.40	$7.40
Washington Perfection Shingles, per M.....	7.18	7.18
Clear Bevel Siding, ½x6".....	43.50	43.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½".....	$8.55	$8.55
Dimension, 2x4", 10 to 16'.....	34.00	32.50
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2x2¼".....	$151.25	$157.50
Clear Plain White Oak, 13/16x2¼".....	110.00	113.50
Clear Plain Red Oak, 13/16x2¼".....	110.00	113.50
Clear Maple, 13/16x2¼".....	100.50	103.00
(All lumber prices furnished by National Lumber Merchant)		
COMMON BRICK—		
Per M. f. o. b. job.....	$23.00	$25.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered.....	$2.60	$2.45
STRUCTURAL STEEL (IRON AGE)—		
Per 100 lb. to large buyers.....	$2.11	$2.09
CRUSHED STONE (cu. yd.)—		
¾ in.	$3.00	$2.70
1½ in.	2.80	**2.55**
WALL BOARD—		
Per 1,000 sq. ft. in lots under 1,000 sq. ft.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.....	45.00	45.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered.....	$18.00	$18.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered.	20.00	20.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	22.00	22.00
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag.....	$0.60	$0.60
Masons, per 50 lb. bag.....	.45	.49
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.50	$1.50
¾ in. Gravel (per cubic yard).....	3.00	2.75
1½ in. Gravel (per cubic yard).....	3.00	2.75
FACE BRICK—		
Tapestry (delivered)	$46.00	$46.00
Caledonian (delivered)	41.50	41.50
Smooth Grey (delivered).....	54.50	54.50
Fisk Lock f. o. b. factory.....	36.00	36.00
SHINGLES—		
Asphalt, Single (per square).....	$8.50	$8.50
Asphalt, Strip (per square).....	6.75	6.75
STAINED WOOD SHINGLES—		
16 in. Extra Clear (per square, delivered).....	$11.00	$11.00
18 in. Eureka (per square, delivered).....	11.00	11.00
18 in. Perfection (per square, delivered).....	12.00	12.00
24 in. Royal (per square, delivered).....	12.25	12.25
24 in. Imperial (per square, delivered).....	12.50	12.50
VITRIFIED SEWER PIPE—		
4 in. (cents per foot).....	$0.10½	$0.11½
6 in. (cents per foot).....	.15¾	.16¼
SLATE ROOFING—		
Bangor or Slatington, 8x16 in. (per sq. at quarry)...	$8.40	$8.40
CORNER BEADS (Galvanized)—		
Per Foot	$0.02½	$0.02½
WALL TIES (Galvanized)—		
Per Thousand	$5.00	$5.00
FLUE LINING—		
8½ x 8½ in. Per Foot.....	$0.27	$0.33
8½ x 13 in., Per Foot.....	.40	.50
HOLLOW TILE—		
8 x 12 x 12 in., heavy. Each, delivered.....	$0.22½	$0.22½
Per Bushel	$0.60	$0.60
HAIR—		
PLASTER BOARD—		
32 x 36 x ⅜ in., Each.....	$0.22	$0.22
MAGNESITE STUCCO—		
Per Ton	$70.00	$70.00
TILE—		
1 in. Square or Hexagon, White, per sq. ft.....	$0.25	$0.25
3 x 6 in. White Wall.....	.60	.60
8 x 8 in. Red Floor.....	.45	.45

CHICAGO PRICES

YELLOW PINE—		
Boards, 1x8, No. 1 Com.....	$40.00	$39.00
Casing and Base, 6-8 in.....	65.00	65.00
Ceiling, ½x4, B. and Btr.....	45.00	44.00
Dimension No. 1, 2x4, 12 to 14 ft.....	35.00	34.00
Drop Siding, 1x6, B. and Btr.....	49.75	47.75
Finish, 1x4, B. and Btr.....	63.00	62.00
Flooring, B. and Btr. E. G., 1x3.....	75.00	74.00
Lath, 4 ft., No. 1.....	7.00	7.20
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	44.00	44.00
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear.....	$94.75	$94.75
Oak Flooring, ⅜x2, Cl. Pl., White.....	72.00	73.50
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear.....	$42.25	$42.25
Finish, S2S or S4S, 1x6 to 8 in. clear.....	91.50	91.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear.....	$43.00	$43.00
Shingles, Extra Clears, 16 in.....	4.80	5.04
COMMON BRICK—		
Per M. f. o. b. job.....	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.07	$2.05
STRUCTURAL STEEL—		
Per 100 lbs. to large buyers.....	$2.11	$2.09
CRUSHED STONE (cu. yd.)—		
¾ in.	$3.00	$3.00
1½ in.	3.00	3.00
WALL BOARD—		
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	$45.00	$45.00
Per 1,000 sq. ft. in lots under M.....	50.00	50.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$3.00	$3.00
¾ in. Gravel (per cubic yard).....	3.00	3.00
1½ in. Gravel (per cubic yard).....	3.00	3.00

ST. LOUIS PRICES

YELLOW PINE—		
Boards, No. 1 Com., 1x4.....	$37.00	$37.00
Partition, ¾x3¼, B. and Btr.....	52.50	55.25
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	34.00	34.50
Finish, S2S, B. and Btr., 1x4, 6 & 8 ft.....	61.00	60.00
Flooring, B. and Btr., E. G., 1x3.....	76.00	74.00
Flooring, B. and Btr., F. G,. 1x3.....	59.00	59.00
Lath, 4 ft., No. 1.....	6.63	6.00
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	41.00	43.00
CALIFORNIA REDWOOD—		
Finish, S2S, Cl., 1x6 in.....	$91.50	$91.50
Siding, 4 in. Bevel, 10 to 20 ft.....	42.25	44.00
8 inch Colonial	53.25	70.75
8 inch Bungalow.....	69.75	70.75
HARDWOODS—		
Oak Flooring, ⅜x1½ and 2 in., Clear Qtr. White.....	106.50	$106.50
Maple Flooring, 13/16x2¼ in., Clear.....	91.00	91.00
RED CEDAR—		
Siding, ½x6, Clear	$41.00	$41.00
Shingles, Clears, Per M.....	5.06	4.96
COMMON BRICK—		
Per M., f. o. b. job.....	$17.00	$17.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.10	$2.10
STRUCTURAL STEEL—		
Per 100 pounds to large buyers.....	$2.20	$2.18
CRUSHED STONE (cu. yd.)		
¾ in.	$1.83	$1.83
1½ in.	1.83	1.83
WALL BOARD—		
Per 1,000 sq. ft. in lots under M.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	45.00	45.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.10	$1.10
¾ in. Gravel (per cubic yard).....	1.30	1.30
1½ in. Gravel (per cubic yard).....	1.25	1.25

Bostwick

TRUSS-LOOP



BOSTWICK "Truss-Loop" effects an **actual saving of money** for the Contractor and Builder in 5 distinct ways, viz.: in Time, Labor, Studding, Lath and Waste Plaster. While more expensive in first cost, BOSTWICK "Truss-Loop" is the cheapest in finished wall cost per square yard, and it **endures.**

The Bostwick Steel Lath Co., Niles, Ohio

The Complete Bostwick Line

"Truss-Loop" Metal Lath
"Diamond A" Expanded Metal
"Niles" Expanded Metal
"Lock" Expanded Metal
"Truss-V-Rib" Re-enforcement
Channel Iron
Corner Bead—Rail
—Standard
—Truss-Wing
Base Bead
Wall Plug
Wall Ties—Y, No. 1, No. 2

Write for prices and full information

Bostwick

BUILDING MATERIALS

VAN GUILDER DOUBLE WALL CO., INC., 20 Engineering Bldg., Rochester, N. Y.

Founders of The Double Concrete Wall

Over eighty Subsidiary Building Companies. New ones organizing continually. The builder controls company and territory. A saving of over one-half the labor cost.

The cost of machines is not the question. It is the quality and cost of the finished product.
We train all our companies; Successful construction Assured.

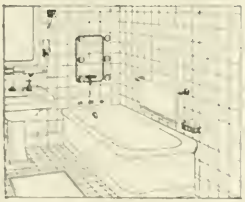
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We have no competition; absolutely in a class by ourselves.
We advocate all Fireproof Construction for the conservation of life and property in the Home.

The Carnegie Steel and the Cambria Steel Companies have invested about a MILLION DOLLARS in Van Guilder Double Wall Concrete homes. *Write for particulars*

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Complete Family Shower Without Curtain



This no-splash shower with its converging streams makes the ideal bath for all the family.

A Kenney Shower, Congress Model, as shown, installed over the end of any built-in tub, makes the complete modern bathing unit. This fixture is moderately priced; and requires the minimum amount of labor to install.

See display at your plumbing contractor or supply house, or write us.

Send for Catalogue. A Kenney Shower, portable or stationary model to meet every need

The Kenney-Cutting Products Corp.
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Note its ruggedness

The Bessler Movable Stairway is built for service. Strength and sturdiness are incorporated into every part.

In addition, it is a space saver and is cheaper than a stationary stairway. It can be easily and cheaply installed. Let the Bessler solve the problem of attic space. Add another room to the house you are designing.

Write for illustrated catalog

The Bessler Movable Stairway Co.

Akron, Ohio

Selected List of Manufacturers' Literature

FOR THE SERVICE OF BUILDERS, CONTRACTORS, ARCHITECTS AND ENGINEERS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to BUILDING AGE & THE BUILDERS' JOURNAL, 920 Broadway, New York, or the manufacturer direct, in which case kindly mention this publication. Either the titles or the numbers may be used in ordering.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

(See also Alphabetical Index, Page 116)

ARCHITECTS' SPECIFICATION HAND BOOK

Truscon Company, Detroit, Mich.

270. 52-page paper-bound, loose-leaf specification book. 8½ x 11 in.

ASBESTOS PRODUCTS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

1. *Ambler Asbestos Shingles. Catalog* 5½ x 8½ in. 40 pp. Illustrated.
2. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog, 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.
3. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog, 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
4. *Ambler Asbestos Building Lumber.* Catalog, 8½ x 11 in. 32 pp. Illustrated.
5. *Engineers' Data Sheets.* Catalog, 8½ x 11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.

ASBESTOS ROOFING—See also Roofing

ASH HOISTS—See also Hoists

ASH RECEIVERS

Sharp Rotary Ash Receiver Corporation, 396 Bridge St., Springfield, Mass.

7. *Catalog E.* Booklet describing the Sharp Rotary Ash Receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6 x 9¼ in.
8. *Catalog F.* A book for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with tables of dimensions for installation. 8 pp. Ill. 6 x 9¼ in.

BALANCES, SASH

Caldwell Mfg. Company, The, Rochester, N. Y.

9. *Suggestions for the Present-Day Architect.* Booklet, 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.

Pullman Mfg. Co., Rochester, N. Y.

10. *Catalog* describes new form of sash balance that can be removed and inserted without removing sash from window.

BAND SAWS

American Saw Mill Machinery Co., Hackettstown, N. J.

11. *Catalog No.* 22 describing a general line of band saws of various sizes.
12. *Technical Data.* Four-page folder, 8½ x 11 in. containing specifications, description, prices and approximate cost of installation. Everything the architect or contractor requires. Proper size for filing.

Crescent Machine Co., Leetonia, Ohio.

241. Descriptive 144-page Catalog.

BAR BENDERS AND CUTTERS

Koehring Company, Milwaukee, Wis.

13. *Four-page folder,* giving illustrations and sizes of Koebring Bar Benders and Cutters.

BATHROOM FIXTURES

Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.

BEDS

Murphy Door Bed Company, Majestic Bldg., Chicago, Ill.

BOILERS—See Heating Equipment

BOOKS

American Technical Society, 58th and Drexel Blvd., Chicago, Ill.

Architectural House Planning Service Co., 20 So. 18th Street, Philadelphia, Pa.

Arrow Book Company, 347 Fifth Avenue, New York City.

U. P. C. Book Co., 243 West 39th Street, New York City.

BLUE PRINTS

Peerless Blue Print Co., 347 Fifth Avenue, New York City.

BRICK

American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.

15. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Sent free.
16. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions are illustrated and described. Size 8½ x 11 in. 116 pp. Price $1.00.
17. *The Home of Beauty.* A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8 x 10 in. 72 pp. Price 50 cents.
18. *Architectural Details in Brickwork.* Three series of beautiful half-tone prints of brickwork detail, contained in closed folders suitable for standard vertical letter file. The three series contain 124 prints in all. Size 8½ x 11 in. Price $1.50 per set.

Common Brick Manufacturers' Association of America, 1309 Schofield Bldg., Cleveland, Ohio.

19. *Brick—How to Build and Estimate.* 3rd edition, 32nd thousand, a manual of solid brick and Ideal wall construction. Contains data on the strength of brickwork, on mortars, bonds and joints and equipment, and contains complete estimating tables for quantities of brick, mortar, material and approximate mechanics' time for various thicknesses and square foot areas of solid and Ideal wall. 8½ x 11 in. 72 pp. Price 25 cents.
20. *Brick for the Average Man's Home.* Book, 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00.

Fiske & Company, Boston, Mass.

245. Tapestry brick, other grades of front brick. Manufacturers of "Fisklock" Brick.

BUILDING CONSTRUCTION—See also Garage Construction

National Manufacturing Co., Sterling, Ill.

Truscon Steel Company, Youngstown, Ohio.

21. *Truscon Floortype Construction.* Form D-352. Contains complete data and illustrations of Floortype installations. 16 pp. Ill. 8½ x 11 in.
22. *Truscon Standard Buildings.* Form D-398. Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8½ x 11 in.
23. *Truscon Building Products.* Form D-376. Contains a brief description of each of the Truscon Products. 112 pp. Ill. 8½ x 11 in.
24. *Modern School Construction.* Form D-395. Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill. 8½ x 11 in.

BUILDING HARDWARE—See Hardware

BUILDING STONE—See Stone, Building

BUILT-IN CLOTHES HANGERS

Knape & Vogt, Grand Rapids, Mich.

BUILT-IN KITCHENS

Bisk Corporation, Brockton, Mass.

BUNGALOW AND SMALL HOUSE PLANS

American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.

25. *Four booklets* of small houses from 3 to 8 rooms, containing 98 reversible designs. (1) 3-4 rooms, (2) 5 rooms, (3) 6 rooms, (4) 7-8 rooms; size 8½ x 11 in. Each booklet 25 cents, set $1.

Architectural House Planning Service Company, 20 South 18th Street, Philadelphia, Pa.

CANVAS—See Roofing Materials

CASEMENTS—See Doors and Windows

CAULKING AND GLAZING COMPOUND

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.

246. Illustrated catalog sent on request.

CEILINGS, METAL

The Edwards Manufacturing Company, Cincinnati, O.

33. *Pamphlet* of 32 pages, describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 in.

Keighley Mfg. Co., 124 Third Avenue, Pittsburgh, Pa.

CEMENT

Alpha Portland Cement Company, Easton, Pa.

34. *Alpha Cement—How to Use It.* Handbook 6 x 9 in. 96 pp. Illustrated. A practical handbook on popular forms of concrete construction, including form work, proper proportions in mixing, waterproofing, colored concrete, etc.
35. *Alpha Service Sheets and Bulletins.* Special suggestions on the construction of Industrial Housing, Garages, Inclosures, Walls, Steps, Sidewalks, Barns, Silos, Farm Buildings, etc.
36. *Alpha Aids.* A bi-monthly magazine for those who buy, sell or use Portland Cement, sent complimentary to approved names.

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

37. *The Atlas Book on Concrete Construction.* A text book written for the average builder in concrete and from the practical rather than from the technical standpoint. Treats on both plain and reinforced concrete. 144 pp. 4½ x 7 in. Cloth bound. Price $2.00.
30. *Set of Blue Prints.* Drawings showing how to apply Portland Cement stucco to the different standard types of wall construction. Appended are tables of the quantities of cement and sand required to cover a given wall surface. Size 8½ x 11.
31. *Concrete on the Farm.* The most comprehensive book of its kind. Practical and thoroughly reliable instructions, with plans and pictures of all possible farm structures for which concrete can be used. Complete directions in practical terms for selection of aggregates and the mixing and placing of concrete.
32. *Other Publications.* The Atlas Portland Cement Company has numerous other publications, covering nearly every phase of concrete construction. Their Service Department will give sound advice on any phase of concrete construction to anyone applying for it.

Koehring Company, Milwaukee, Wis.

38. *Concrete—Its Manufacture and Use.* Book, 4½ x 7 in. Illustrated. 207 pp. Comprehensive discussion from the practical standpoint of concrete.

Lehigh Portland Cement Co., Allentown, Pa.

40. *The Expense-Proof Farm.* Book of 96 pp. Illustrated. Showing methods of constructing various buildings, fence posts, water troughs, etc., used about the farm.

CHAINS

Bridgeport Chain Co., Bridgeport, Conn.

29. *Catalog No.* 14. Contains 64 pp. Illustrated, of different chains that can be used in all parts of building construction.

CLAMPS

James L. Taylor Mfg. Co., Poughkeepsie, N. Y.

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Cleveland, Ohio

The Ideal Brick Hollow Wall is made of standard brick obtainable everywhere

Ideal Brick Hollow Wall

"Brick Homes at the Cost of Frame"

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 74*

COAL CHUTES
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

COLUMN AND BEAM COVERING
United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
39. *32-page booklet*, 8½ x 11. Pyrobar Tile.

COLUMNS
Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.
233. *Catalog No. D-47*. 48 pages, illustrated. 7¼x10 in. Illustrating the Koll's Patent Lock-Joint Wood Columns.

CONCRETE APPLIANCES
255. *Catalogue No.* 11. This is a new catalogue describing the new Steel Burial Vault Molds. It is 8 pages, 6 x 10 in.
Universal Cement Mould Co., No. Milwaukee, Wis.
41. *Illustroted Folder* describing mold for building hollow concrete walls for homes, garages, barns, silos, etc.
Van Guilder Double Wall Co., 77 South Avenue, Rochester, N. Y.
42. *A Catalog* describing the Van Guilder system of portable forms for the building of hollow concrete walls on the thermos bottle idea for the erection of homes, ice houses, barns, silos, etc. Walls are dry, as there is continuous air space around entire building.

CONCRETE MACHINERY
A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
43. *Descriptive Illustrated Circular* of Magic Concrete Mixer.
The American Cement Machine Co., Inc., Keokuk, Iowa.
Badger Concrete Mixer Co., Majestic Bldg., Milwaukee, Wis.
Concrete Equipment Co., 535 Ottawa Street, Holland, Mich.
Concrete Block Machine & Mold Co., 114 S. 2nd Street, St. Louis, Mo.
253. *Catalogue No.* 38. Describes Building Block Machines. It is a 40-page book, 6 x 10 in.
C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
Ideal Concrete Machinery Co., 1334 Monmouth Street, Cincinnati, Ohio.
Jaeger Machine Co., 216 Dublin Avenue, Columbus, Ohio.
Koehring Co., Milwaukee, Wis.
46. *Koehring Construction Mixers.* Booklet. 7¾ x 10½ in. Illustrated. 96 pp. Complete information on construction type concrete mixers.
47. *Koehring Dandie Mixer.* Booklet, 6 x 9 in. Illustrated. 24 pp. Illustrating and describing Koehring line of Dandie light mixers.
265. *"Built to Endure."* A beautifully bound booklet of 36 pages, 7½ x 10 in., describing Comparative Examples of Notable Ancient and Modern Construction Embodying the Element of Permanency.
Little Whirlwind Mixer Co., 438 Gould Street, La Crosse, Wis.
Republic Iron Works, Box 602, Tecumseh, Mich.
Standard Scale & Supply Co., 1631 Liberty Avenue, Pittsburgh, Pa.

CONCRETE MARBLE
Art Stone Co., Waynesboro, Pa.
45. *Descriptive Circulars* with illustrations of different marbles in colors. Sent free to any interested party.

CONSTRUCTION, FIREPROOF
National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
226. *Standard Fire Proofing Bulletin* 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fireproof floor construction.
National Pressed Steel Co., Massilon, Ohio.
United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
48. *Pyrobar Gypsum Tile.* Booklet, 8½ x 11 in. 32 pp. Illustrated. Detail and specifications for fireproof partitions.
49. *Bulletins*, 8½ x 11 in. Containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

CONTRACT AND ESTIMATE BLANKS
L. Fink & Sons Printing Co., Laurel Spring, N. J.
166. *Catalog and Samples* of contract sheets, estimate blanks, job tickets, time sheets, wage receipts, etc., with prices.

CRYSTALS, MICASPAR
Crown Point Spar Co., 101 Park Avenue, New York.
276. *50-page descriptive catalog*, describing the advantages and uses of the Sparkling Micaspar Crystals.

DAMPERS AND ASH DUMPS (Fireplace)
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.
Stover Mfg. & Engine Co., 747 Lake Street, Freeport, Ill.

DAMP-PROOFING
Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
Cortright Metal Roofing Co., Philadelphia, Pa.
Illinois Zinc Co., 280 Broadway, New York.
National Sheet Metal Roofing Co., 339 Grand Street, Jersey City, N. J.
Rochond Co., Van Wert, Ohio.
F. C. Sheldon Slate Co., Granville, N. Y.

DOOR CHECKS
Park Manufacturing Co., Worcester, Mass.
50. *Catalog* contains description of six models of the new improved Worcester-Blount Door Check.

DOORS AND WINDOWS
The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.
247. BOCA steel sash. (E-22). A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.
Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.
Hess Warming & Ventilating Co., 1201 Tacoma Bldg., Chicago, Ill.
Henry Hope & Sons, 103 Park Ave., New York.
51. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¼ x 18½ in. 32 pp.
Truscon Steel Company, Youngstown, Ohio.
52. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.
53. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill. 8½ x 11 in.

DOOR AND WINDOW FRAMES
Andersen Lumber Company, South Stillwater, Mino.
55. *General Catalog* for architects, contractors, engineers, carpenters or builders. Describes and illustrates fully Andersen Standard White Pine Window, Cellar Frames, Sash Frames and Door Frames. Gives details of construction, variety of sizes and uses for ordinary as well as special construction, and method of assembly. Size 7¾ x 10¾, 24 pages.
56. *Better Frames for Less Money* for consumers. Interesting folder showing advantages of Andersen Standard White Pine Frames. Uses, sizes and details of construction.

DRAFTING MATERIALS
A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
Keuffel & Esser Co., Hoboken, N. J.
Peerless Blue Print Co., 347 Fifth Avenue, New York City.
Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.

DUMBWAITERS
Kimball Bros. Co., 1106 Ninth Street, Council Bluff, Iowa.
Sedgwick Machine Works, 156 W. 15th Street, New York.
57. High grade Hand Power Elevators and Dumbwaiters for All Purposes. Illustrated catalog, 52 pages; dumbwaiter service sheet, and pamphlets descriptive of many special types of outfits.

ELECTRICAL DEVICES
Arrow Electric Co., Hartford, Conn.

ELECTRIC METER BOXES
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

ELEVATORS
Kimball Brothers Company, Council Bluffs, Iowa.
58. *Kimball Elevators.* An illustrated catalog of hand power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7¾ x 10¾ in.
Richards-Wilcox Mfg. Co., Aurora, Ill.
59. *"Ideal" Elevator Door Equipment.* Catalog showing elevator door hangers for one, two or three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.
Sedgwick Machine Works, 156 West 15th Street, New York.

FACTORY EQUIPMENT
The Edwards Mfg. Co., Cincinnati, Ohio.
60. *Edwards' Steel Equipment.* Illustrated catalog. Showing steel lockers and shelving for factories, offices, stores, schools and hospitals, together with illustrations and description of "Edmanco" steel office furniture and filing cabinets. Size 8 x 11 in. 32 pp.

FIREPLACES AND MANTELS
Apex Fireplace Co., Urbana, Ill.
King Mantel & Fireplace Co., Knoxville, Tenn.
Strait & Richards, Inc., Newark, N. J.
62. *Catalog* describing fireplaces, electric and gas logs, heatings supplies, heaters, etc.

FLOOR HARDENERS
Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
61. *Agates and Its Performances.* Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FLOORING LUMBER
The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
63. *The Perfect Floor.* Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5¼ x 7½ in.
Oak Flooring Advertising Bureau, 1014 Ashland Block, Chicago, Ill.
64. *Modern Oak Floors.* Booklet. 6½ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
65. *Oak Flooring, How and Where to Use It.* Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.
257. *Oak Flooring for Factories and Warehouses.* Booklet. 3½ x 6 in. 16 pp. Illustrated. Small general book featuring No. 2 Common Oak Flooring for hard usage in factories and warehouses, with testimonials.
Pacific Lumber Co., 2070 McCormick Bldg., Chicago, Ill.
United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.
66. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins, 8½x11. Pyrofill.
Wood Mosaic Co., New Albany, Ind.
227. *Catalogue* of wood-carpet, strips, plain and ornamental parquetry, tongue and groove flooring in natural wood colors.

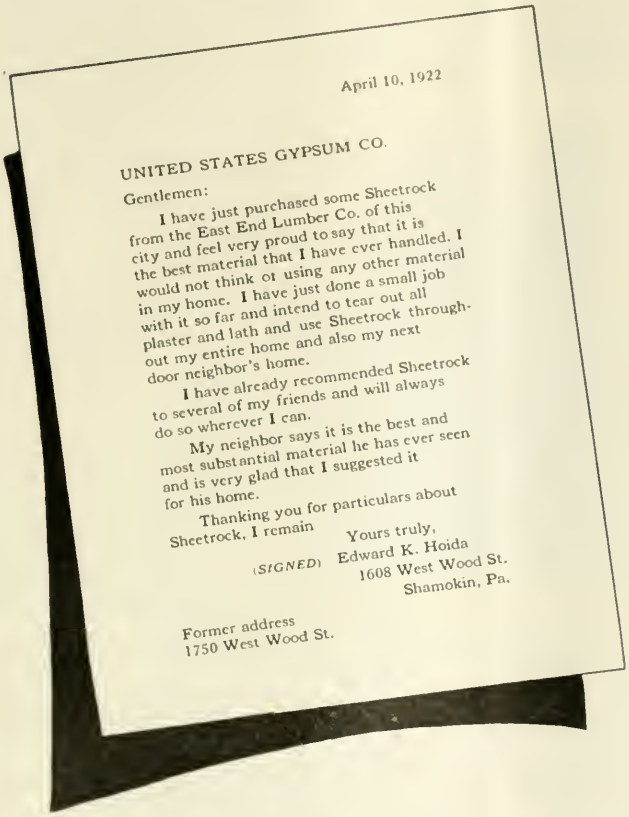
FLOORING COMPOSITION
Everlasbestos Flooring Co., Rochester, N. Y.
National Kellastone Co., 155 East Superior Street, Chicago, Ill.

FLOOR SURFACING
Amer. Floor Surfacing Machine Co., 521 So. St. Clair Street, Toledo, Ohio.
Waydell Chappell & Co., 137 No. Jackson Street, Waukegan, Ill.
M. L. Schleuter, 223 W. Illinois Street, Chicago, Ill.

FLOOR VOIDS FOR USE IN CONCRETE
United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.
67. *Loose-leaf Bulletins.* 8½ x 11. Pyrobar Gypsum Floor Tile.

FURNACES—See Heating Equipment

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Yours truly,
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Shamokin, Pa.

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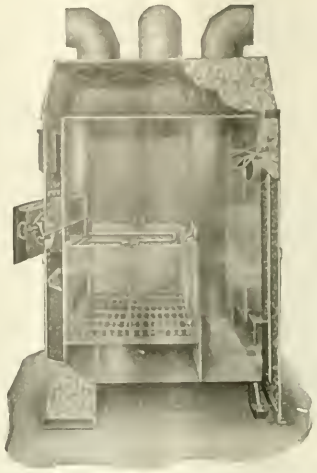
Address _____

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 76*

GARAGE CONSTRUCTION
McKinney Mfg. Co., Pittsburgh, Pa.
283. *Interesting 16-page Catalog,* describing the complete hardware for various types of Garage Doors.
National Mfg. Co., Sterling, Ill.
248. Catalog of Garage Hardware.
GARBAGE DESTROYERS
Kerner Incinerator Company, 1027 Chestnut Street, Milwaukee, Wis.
68. *The Sanitary Elimination of Household Waste.* M-3 Folder. Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. 4 x 9 in.
GARBAGE RECEIVERS.
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.
GLASS
American Window Glass Co., Pittsburg, Pa.
69. Send for circular describing different varieties of window glass and how to select the proper kind.
American Three-Way Luxfer Prism Co., Cicero (Chicago), Ill.
70. Write for details and prices of glass prisms that will project daylight into dark interiors.
71. Other literature with reference to apartment house installations.
Plate Glass Mfgs. of America, 1st Nat'l Bank Bldg., Pittsburgh, Pa.
GYPSUM
United States Gypsum Company, 205 W. Monroe Street, Chicago, Ill.
HARDWARE
Bridgeport Brass Co., Bridgeport, Conn.
Caldwell Mfg. Co., 5 Jones Street, Rochester, N. Y.
Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.
Griffin Mfg. Co., Erie, Pa.
Hess Warming & Ventilating Co., 1204 Tacoma Building, Chicago, Ill.
240. 24-*Page Illustrated Catalog.* 4x6 in. Describing the Sanitary Medicine Cabinet, Lockers and Lavatory Mirrors.
H. B. Ives Co., New Haven, Conn.
The Kawneer Co., Niles, Mich.
72. *Kawneer. Simplex Window Fixtures.* Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½ x 10¾ in. 16 pp.
Knape & Vogt Mfg. Co., Grand Rapids, Mich.
73. Garment Hangers. Send for illustrated booklet.
McKinney Mfg. Co., Pittsburgh, Pa.
F. E. Myers & Bro. Co., Ashland, Ohio.
National Mfg. Co., Sterling, Ill.
National Mill & Lumber Co., 2 Rector Street, New York.
Richards-Wilcox Mfg. Co., Aurora, Ill.
75. *Modern Hardware for Your Home.* Catalog of hangers for varnishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Slidetite" garage door hardware. 24 pp. Illustrated. 8½ x 11 in.
Sargent & Company, New Haven, Conn.
The Stanley Works, New Britain, Conn.
76. *Wrought Hardware.* New 1921 Catalog. This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 676 pp. Illustrated. 6½ x 9½ in.
77. *Garage Hardware.* Booklet, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustration and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.
78. *Eight Garages and Their Stanley Hardware.* Booklet. Plans, drawings and complete hardware specifications. Size 5 x 7 in. 32 pp.
79. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in. 32 pp.
Upson Company, Lockport, New York.
HEATING EQUIPMENT
Co-operative Foundry Co., Rochester, N. Y.
230. Manufacturers of pipeless furnace.
The Farquhar Furnace Company, Wilmington, Ohio.
80. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Illustrated. 4¼ x 9¼ in.
81. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Illustrated. 8½ x 11 in.
Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.
Hess Warming & Ventilating Co., 1205D Tacoma Building, Chicago, Ill.
82. *Modern Furnace Heating.* Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.
Holland Furnace Co., Holland, Mich.
198. 24-*Page Illustrated Catalog.* Containing some sound advice on the heater and some miscellaneous points.
Kelsey Heating Company, James Street, Syracuse, N. Y.
83. *Booklet No. S.* 4 x 9. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.
84. *Monroe Pipeless Booklet.* 4½ x 8 in. 20 pp. Illustrated.
85. *Monroe Tubular Heater.* Booklet. 4¼ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
86. *Syracuse Pipeless Booklet.* 4½ x 8 in. 12 pp. Illustrated. General Booklet giving sizes and capacities.
87. *Valves, Syphons and Traps.* A series of pamphlets to enclose in envelopes, describing the well known Thermostatic Return Line Valves and other heating equipment specialties made by this company.
Magee Furnace Co., Boston, Mass.
259. *Illustrated booklet* describing the new heater. The Magee Furnace Co. have been very successful with their coal, gas and electric combination ranges which they manufacture in various styles and sizes. As they express it, they have just produced a new member in their electric family which they call the ElectriGas. This is a very compact and attractive electric and gas range. The electric half comprises an insulated electric oven or fireless cooker of good size and an electric broiler. These are controlled from electric switches in front on their patented switchboard. The Gas half includes four gas burners and a simmerer which are automatically lighted from a push button. These ranges are made in ebony black or pearl gray por-cel-a finish. The sales department of the Magee Company report that great interest is being shown in this ElectriGas range all over the country. There are so many good talking points and attractive features in the Magee ElectriGas that it will undoubtedly prove a great seller. This range is also made in straight electric and straight gas, as well as in this combination.
Sill Stove Works, Rochester, N. Y.
Strait & Richards, Inc., Newark, N. J.
88. *Catalog* describing fireplaces, electric and gas logs, heaters, etc.
HINGES
McKinney Mfg. Co., Pittsburgh, Pa.
HOISTS—See Elevators
American Saw Mill Machinery Co., Hackettstown, N. J.
89. *Bulletin No.* 10 describing several kinds of builders' hoists.
The Brown & Clutch Co.
262. 16-*page illustrated booklet,* 3½ x 9 in., describing the various model hoists manufactured by "Brown & Clutch."
C., H., and E. Mfg. Co., Milwaukee, Wis.
90. *Bulletin No.* 3. Hoists and Mortar Mixers.
HOLLOW TILE
Fiske & Company, Boston, Mass.
Hollow Building Tile Association, Chicago, Ill.
National Fire Proofing Co., Pittsburgh, Pa.
INCINERATORS—See Garbage Destroyers
INSULATION
Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
92. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.
Samuel Cabot, Inc., 141 Milk St., Boston, Mass.
249. Cabot's Quilt. Catalog containing drawings and description.
United States Mineral Wool Co., 280 Madison Avenue, New York, N. Y.
94 *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼ x 6¾ in. 24 pp.
JOISTS AND STUDS, PRESSED STEEL
General Fireproofing Co., Youngstown, Ohio.
National Pressed Steel Co., Massillon, Ohio.
96. *Descriptive 4-page folder* on metal lumber for building construction.
Truscon Steel Company, Youngstown, Ohio.
95. *Truscon Steel Joists.* Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.
KITCHEN EQUIPMENT
National Mill & Lumber Co., 2 Rector Street, New York.
277. 10-*Page Illustrated Folder.* Describes the necessity and advantages of a National Built-In Ironing Board.
LATH, METAL AND REINFORCING
The Bishopric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.
Buffalo Wire Works Co., Inc., 446 Terrace, Buffalo, N. Y.
258. Write for Booklet 61-F on wire lathing.
General Fireproofing Co., Youngstown, Ohio.
97. *Catalog* describes Herringbone Rigid Metal Lath, how it is applied and used, with detailed drawings, specifications, etc. 32 pp.
National Pressed Steel Co., Massillon, Ohio.
Truscon Steel Co., Youngstown, Ohio.
99. *Hy-Rib and Metal Lath.* 18th Edition. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.
LEVELS
A. S. Aloe Co., 513 Olive Street, St. Louis, Mo.
L. Beckman Co., 1004 Jackson Street, Toledo, Ohio.
Eugene Dietzgen Co., 162 W. Monroe St., Chicago, Ill.
Keuffel & Esser Co., Hoboken, N. J.
Warren-Knight Company, 136 North 12th St., Philadelphia, Pa.
100. *"Sterling" Levels and Transits.* 32 pp. illustrated catalog. Description, specifications and structural advantages required in modern practice for establishing lines, levels, angles, etc. Vest Pocket Manual of adjustments.
David White Co., 907 Chestnut Street, Milwaukee, Wis.
LIGHTING
American Three-Way Prism Co., 1307 South 55 Court, Cicero, Ill.
98. *Descriptive Circular* on the use of prisms for directing light to dark corners.
LIGHTNING RODS
E. G. Washburne Co., 207 Fulton Street, New York.
232. *Descriptive Catalog in Colors.* Showing different designs of weather vanes, lightning rods, ventilators, etc.
LIGHTING SPECIALTIES
I. P. Frink, Inc., 24th Street and 10th Avenue, New York, N. Y.
250. *Lighting Service for Hospitals.* A booklet illustrated with photographs and drawings, showing the types of lights for use in hospitals, as operating table reflectors, linolite and multilite

The Hess Welded Steel Furnace

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NEVER LEAKS



WITH PIPES

Phantom picture showing through the side of the furnace. The firebox and ashpit are wholly inclosed within the welded steel radiator.

This furnace has no castings next to the air chamber, to warp and open in the joints and leak gas and dust. Everything is hermetically sealed up in the steel inclosure. There are no cemented joints (cracks). No inner flues nor passages to clog and prevent radiation. All the inner parts may be removed without dismantling the heater.

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Special Rates to Contractors and Dealers

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 78*

concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses. Size 7 x 10 in. 12 pp.

251. *Frink Reflectors and Lighting Specialties for Stores.* Catalog No. 424. A catalog containing a description of the Frink Lighting System for Stores; the Synthetic System of Window Illumination; and a number of appliances to produce the most effective lighting of displayed objects. 30 pp. Illustrated. 8 x 11 in.

252. *Frink Lighting Service for Banks and Insurance Companies.* Reflectors. Catalog No. 425. A very interesting treatise on the lighting of offices; with details of illustrations and description of lamps and reflectors. Contains a list covering several pages, of banks using Frink Desk and Screen Fixtures. 30 pp. Illustrated. 8¼ x 11 in.

LUMBER

Arkansas Soft Pine Bureau, 802 Boyle Building, Little Rock, Ark.

101. *Arkansas Soft Pine Handbook.* Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Molding Designs.

102. *The Home You Long For.* Booklet. 8½ x 11 in. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.

Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.

104. *The Post Everlasting.* Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.

228. *Poles That Resist Decay.* Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.

105. *"From Tree to Trade,"* a 48-page illustrated description of the manufacture of lumber from tree to use. Describes methods of logging, construction, etc.

Pacific Lumber Company of Illinois, The, 1105 Lumber Exchange Building, Chicago, Ill.

106. *Engineering Digest.* Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipes, Outbuildings, Irrigation Flumes, Drainage Boxes, Greenhouses, etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.

Southern Cypress Mfrs. Assn., 1227 Poydras Bldg., New Orleans, La.

107. *Many interesting booklets* on the use of Cypress for all purposes.

Weyerhaeuser Forest Products, St. Paul, Minn.

LUMBER ASBESTOS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

108. *Ambler Asbestos Building Lumber.* Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½ x 11 in. 32 pp.

MARBLE, ARTIFICIAL

Art Stone Co., Waynesboro, Pa.

METAL LATH—See Lath, Metal and Reinforcing

METALS AND METAL BUILDING SPECIALTIES

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.

111. *Reference Book.* Pocket Edition. 2¼ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.

113. *Apollo and Apollo-Keystone Galvanized Sheets.* Catalog. 8½ x 11 in. 20 pp. Illustrated.

114. *Research in the Corrosion Resistance of Copper Steel.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.

115. *Facts Simply and Briefly Told.* Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.

116. *Black Sheets and Special Sheets.* Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc. Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

The Donley Bros. Co., 7400 East 74th Street, Cleveland, Ohio.

237. *28-Page Illustrated Catalog* on "Donley Devices and Building Specialties." 6 x 9 in.

N. & G. Taylor Co., Philadelphia, Pa.

117. *Booklet and Detail Sheet of Tin Roofing.* See Roofing.

METAL TRIM—See Doors, Windows and Metal

MILLWORK—See also Lumber—Building Construction—Doors and Windows

MORTAR—See also Cement

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.

118. *Clinton Mortar Colors.* Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

PACKAGE RECEIVER

The Denley Bros., 3700 East 74th Street, Cleveland, Ohio.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Samuel Cabot, Inc., Mfg. Chemists, 141 Milk Street, Boston, Mass.

S. C. Johnson & Son, Racine, Wis.

122. *The Proper Treatment for Floors, Woodwork and Furniture.* Booklet. 6½ x 8¾ in. 32 pp. Illustrated in color. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.

123. *Portfolio of Wood Panels.* 5½ x 10¾ in. 14 pp. A portfolio containing actual panels of finished woods. Also contains valuable information on finishing and re-finishing floors and woodwork.

John Lucas & Co., Inc., Philadelphia, Pa.

264. *100-page "Descriptive Catalog."* 6 x 9 in. Published for the purpose of familiarizing "Lucas" distributors with the characteristics, purposes and uses of "Lucas Paints and Varnishes."

National Lead Co., 111 Broadway, New York City.

124. Handy Book on Painting. Book 5½ x 3¼ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal, etc., both interior and exterior.

Eugene E. Nice & Company, 268 South Second Street, Philadelphia, Pa.

125. *Price List "C01"* contains descriptions of various paints, japans, varnishes, glue, stains, varnish remover, etc. 48 pp. Pocket size. Sent to any address.

Ripolin Co., The, Cleveland, Ohio.

256. *Ripolin Specification Book,* 8 x 10¼ in., 12 pp. Complete architectural specifications and general instructions for the application of Ripolin, the original Holland Enamel Paiot. Directions for the proper finishing of wood, metal, plaster, concrete, brick and other surfaces, both interior and exterior, are included in this Specification Book.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

131. *Spread the Sunshine Inside.* Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories.

PARTITION STEEL

Empire Steel Partition Co., College Point, Long Island, N. Y.

PARTITION SYSTEM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

133. *Loose leaf bulletins,* 8½ x 11 in. Jester-Sackett, consists of plaster board applied to metal channels with special clip, ready for plastering.

PARTITION TILE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

134. *Fireproof.* 32-page booklet, 8½ x 11 in., including description, specifications, and working details of Pyrobar partition tile.

PLASTER BASE

The Bishopric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.

PLASTER BOARD

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

135. *Pamphlets,* describes Sackett Plaster Board used instead of wood or metal lath.

PLASTER—(Interior)

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

PERGOLAS

Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.

235. *Album No. 33.* 7½ x 10½ in. 42 pages of illustrated literature regarding the various types of Pergolas.

PLASTER, INTERIOR

National Kellastone Co., 155 East Superior Street, Chicago, Ill.

PLUMBING SUPPLIES

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

Hess Warming & Ventilating Co., 1203D Tacoma Bldg., Chicago, Ill.

136. *Hess Sanitary Steel Medicine Cabinets.* Booklet. 4 x 6 in. 16 pp. Illustrated.

B. Karol & Sons Co., 806 So. Kedzie Avenue, Chicago, Ill.

Trenton Potteries Co., Trenton, N. J.

257. *Our New Catalog Shows These Details.* If our new Catalog R is not on your desk, by all means send for a copy. Architects who have seen it quite generally pronounce it the most completely comprehensive catalog of plumbing fixtures in their experience. Not only are complete specifications given, but the detail drawings are invaluable in showing exactly how and when a certain type should be used.

PUMPS

C. H. & E. Mfg. Co., Milwaukee, Wis.

251. Bulletin No. 2. Pumps.

The F. E. Myers & Bro. Co., Ashland, Ohio.

137. *General Catalog.* 6 x 9 in. 392 pages. Shows complete line of Myers Products—Pumps for Every Purpose, Hay Tools, Door Hangers, Store Ladders, etc. Of particular interest to hardware and implement dealers; plumbers, architects, contractors and builders; mill, mine, factory and railway superintendents and purchasing agents; highway contractors and builders.

138. *Catalogs.* 6 x 9 in. Devoted to separate lines: No. 55, Pump—Hand and Power Pumps; No. PP-55, Power Pumps; No. HT-55, Hay Tools, Door Hangers and Store Laddera; No. HP-22, Hydro-Pneumatic Pumps, Electric House Pumps, Direct Water Systems; No. SOP-21, Self-Oiling Power Pumps; No. MC-21, Cylinder and Working Barrels; No. SP-22, Spray Pumps and Spraying Accessories. All catalogs fully illustrated.

REFRIGERATION

McCray Refrigerator Co., 2264 Lake Street, Kendallville, Ind.

ROOF DECKS

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

139. *Loose leaf bulletins.* 8½ x 11. Describing Pyrobar Roof Tile, which is laid directly on purlins or tee irons, joints grouted, and is then ready for roof covering.

ROOFING MATERIALS

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.

American Sheet & Tin Plate Company, Pittsburgh, Pa.

140. *"Better Buildings."* Catalog. 8½ x 11 in. 32 pp. Describing Corrugated and Formed Sheet Steel Roofing and Siding Products—Black, Painted and Galvanized; together with directions for application of various patterns of Sheet Steel Roofing in various types of construction.



Roof stained with Cabot's Creosote Stains. Walls finished with Old Virginia White. Lined with Cabot's Quilt for warmth
Prentice Sanger, Architect, New York

For Roofs, Siding, Timbers and all Other Outside Woodwork

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They have proved their merit in every climate for nearly forty years. The colors are soft, rich and harmonious, the Creosote penetrates the wood, preserves it, and makes it less inflammable. Shingles make the warmest and cheapest outside finish, and a shingled house stained with Cabot's Stains is the ideal, cozy American country home.

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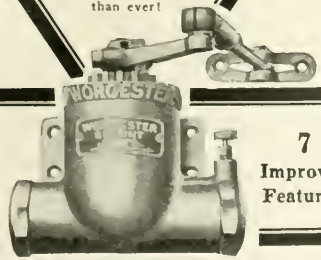
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A complete kitchen behind ornamental doors - 7'x11'

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SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 80*

112. *Copper—Its Effect Upon Steel for Roofing Tin.* Catalog 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
141. *Specifications and Price List.* Descriptive booklet. Details of Ambler Asbestos Cement Roofing Slates, "Century" Asbestos Shingles and Asbestos Corrugated Sheathings. Tables and drawings. Size 6 x 9 in. 44 pp.
142. *Ambler Asbestos Corrugated Roofing.* Catalog gives complete data for specifying, drawings, methods of applications, tables, etc. Size 8½ x 11 in. 20 pp.
Wm. L. Barrell Co. of N. Y., Inc., 50 Leonard Street, New York.
143. *Prepared Canvas for Roofing.* Samples can be obtained on application. A canvas for every use.
John Boyle & Co., Inc., 112-114 Duane Street, New York, N. Y.
154. *Boyle's Bayonne Roof and Deck Cloth.* List B 93. A prepared roofing canvas guaranteed waterproof for decks and the roofs and floors of piazzas, sun-parlors, sleeping porches, etc.
Copper & Brass Research Association, 25 Broadway, New York City.
267. *"How to Build a Better Home."* 36-page illustrated catalog. 8 x 10½ in. This not only describes but teaches the prospective buyer the essential facts of building, finance, hardware and roofing.
Cortright Metal Roofing Co., Philadelphia, Pa.
236. Four-page circular describing the various shingles.
Creo-Dipt Company, 1025 Oliver Street, North Tonawanda, N. Y.
153. *Standard Stained Shingle.* Samples of different kinds mailed on request.
154. *Architectural Service Sheets.* 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.
Edwards Mfg. Co., 423 Eggleston Avenue, Cincinnati, Ohio.
C. G. Hussey & Co., Pittsburgh, Pa.
227. *Copper Roofing and Flashings.* Book No. 6. 34 pp.
Illinois Zinc Company, 280 Broadway, New York, N. Y.
155. *Pure Rolled Zinc.* (Corrugated and Plain Sheets.) Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Facts regarding adaptability of zinc for roofing. Specifications of corrugated zinc sheets. Weights per square. Comparative gauge lists.
156. *The Roof That's Always New.* Booklet. 3½ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley, ridge and hip piece.
National Sheet Metal Roofing Co., 339 Grand St., Jersey City, N. J.
159. *Manufacturers of Metal Shingles* in various designs, both in painted tin or galvanized iron. Samples sent to interested parties.
Richardson Co., Lockland, Cincinnati, Ohio.
F. C. Sheldon Slate Co., Granville, N. Y.
N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.
160. *Selling Arguments for Tin Roofing.* Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.
United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
161. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins. 8½ x 11. Pyrofill.
Vendor Slate Co., Easton, Pa.
Vulcanite Roofing Co., Buffalo, N. Y.

RULES
A. S. Aloe, St. Louis, Mo.
Eugene Dietzgen Co., 162 Ft. Monroe Street, Chicago, Ill.
Keuffel & Esser, Hoboken, N. J.
Sargent & Co., New Haven, Conn.
Stanley Rule & Level Co., New Britain, Conn.

SASH CHAINS, HOOKS AND ATTACHMENTS
The Bridgeport Chain Co., Bridgeport, Conn.
209. *An interesting catalog* describing fully Sash Chain in Steel (six sizes and six finishes), in Bronze (six sizes), Hooks and Sash Chain Attachments.

SASH CORD
Samson Cordage Works, Boston, Mass.

SAW MACHINERY
American Saw Mill Machinery Co., Hackettstown, N. J.
162. *Catalog No. 21*, describing Circular Saws of all sizes.
163. *General Catalog No. 22* and *special Bulletin No. 77*, describing sawing machinery for use on the job in the shop.
W. F. & John Barnes Co., 71 Ruddy Street, Rockford, Ill.
C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
164. *Bulletin No. 1, Saw Rigs.*
Crescent Machine Co., 206 Main Street, Leetonia, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N. Y.
C. E. Jennings Co., 321 Winthrop Avenue, New Haven, Conn.
Parks Ball Bearing Machine Co., Station A, Cincinnati, Ohio.
Sidney Machine Tool Co., Sidney, Ohio.

SAWS
E. C. Atkins Co., Indianapolis, Ind.
286. Booklet and chart describing saws. Especially the cross cut saw.

SCREENS
American Wire Fabrics Company, 208 South La Salle Street, Chicago, Ill.
165. *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enamel, galvanized, galvanoid, American bronze. 30 pp. Illustrated. 3½ x 6¼ in.

SHEATHING
Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
171. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.
Porete Mfg. Co., 20 Verona Avenue, Newark, N. J.
United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.
173. *Eight-page Folder.* Describes Adamant Sheathing Board for use instead of wood sheathing.

SHINGLES—ASPHALT
Winthrop Tapered Asphalt Shingles, 19 So. La Salle St., Dept. No. D-20, Chicago, Ill.

SHINGLES—METAL
Cortright Metal Roofing Co., 50 North 23rd Street, Philadelphia, Pa.
174. *"Concerning That Roof."* A complete catalog describing and illustrating Cortright Metal Shingles and Trimmings. 7 x 10¼ in. 32 pp.

SHOWERS, CURTAINLESS
Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.
260. *4-page File and Reference Sheet* describing six different models of the shower.
261. *Six-page folder* embodying the slogan, "A Bath a Day Keeps You Fit Every Way."

SLATE—See also Roofing
Knickerbocker Slate Corp., 153 East 38th Street, New York, N. Y.
F. C. Sheldon Slate Co., Granville, N. Y.
175. *Commercial and Architectural Roofing Slate* in all colors and textures. Also blackboards, structural and electrical slate. Slate Granules.
Vendor Slate Co., Easton, Pa.

STAIRWAYS
Bessler Movable Stairway Co., Akron, Ohio.
169. *Illustrated catalog*, containing 24 pp., describes how the Bessler Movable Stairway saves floor space and adds an extra convenience to the home.

STANDARD BUILDINGS
Truscon Steel Co., Youngstown, Ohio.
176. *Truscon Standard Buildings.* Fourth Edition. Catalog. 8½ x 11 in. 40 pp. Illustrated. Erection details, cross-section diagrams and adaptations are given.

STEEL FORMS
Concrete Block Machine & Mold Co., 114 S. 2nd St., St. Louis, Mo.
254. Catalog No. 5. This is a new catalog describing the Adjustable Steel Culvert Forms. 8-page book. 6 x 10 inches.

STONE, BUILDING
Art Stone Co., Waynesboro, Pa.
170. *Descriptive circulars with illustrations* of different marbles in colors. Sent free to any interested party.

STORE FRONTS
J. W. Coulson Co., Columbus, Ohio.
278. Store Front Construction simplifies the problem for the builder and owner. It beautifies and enhances the value of store property. A special device prevents glass breaking.
Detroit Show Case Co., 1660 W. Fort Street, Detroit, Mich.
Kawneer Co., Niles, Mich.
177. *Kawneer Store Front.* Illustrated catalog. Drawings and details of construction. Size 8½ x 11 in. 32 pp.
178. *Full Size Details Kawneer Construction.* Blue prints. Size 30 x 30 in.
179. *A Collection of Successful Designs.* Portfolio. Shows 24 typical store fronts with elevations. Size 9 x 12 in. 32 pp. Catalog B. 7. 8. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STRUCTURAL STEEL
National Pressed Steel Co., Massillon, Ohio.

STUCCO—See also Cement
American Materials Co., 101 Park Avenue, New York, N. Y.
The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.
182. *The Stucco House.* Contains many beautiful illustrations of houses finished with stucco and selected particularly for their architectural value. Detailed illustrations of stucco surface textures and drawings showing wall construction with revised specifications covering application of stucco. 96 pp. 8½ x 11 in. Price 50 cents.
180. *Guide to Good Stucco.* A book telling of the advantages of Portland Cement stucco, and how to apply it. Shows numerous finishes obtainable with ATLAS WHITE Portland Cement. 28 pages. 8½ x 11 in.
The Bishopric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.
National Kellastone Company, 155 East Superior Street, Chicago, Ill.
183. *Specifications for Stucco Work.* A booklet containing complete specifications in detail for the use of Kellastone stucco for new buildings as well as the "overcoating" of old buddings. 13 sheets of text, 2 sheets of illustrations. 8 x 11 in.
184. *The Story of Kellastone Imperishable Stucco.* In this most interesting book the merits of Kellastone are set forth in a convincing manner. Every page contains pictures of beautiful houses stuccoed with Kellastone, and there are two pages in color. 22 pp. Illustrated. 8½ x 12 in.
Rochond Co., Van Wert, Ohio.
268. *"Fortifies Your Home Against the Elements and Time."* 16-page folder. 3½ x 6 in.
269. *"Better Homes."* 12-page booklet, 7¾ x 8 in., describing the advantages of "Rochond."

STUCCO BASES
Bishopric Manufacturing Co., 103 Este Avenue, Cincinnati, Ohio.
181. *Bishopric for All Time and Clime.* Catalog. 7½ x 11 in. 52 pp. Illustrated. Describing the use of Bishopric Stucco and Plaster Base and Bishopric Sheathing.

STUCCO-MAGNESITE—See Stucco
American Materials Company, 101 Park Avenue, New York, N. Y.; Weed Street and Sheffield Avenue, Chicago, Ill.
185. *Elastica, the Stucco of Permanent Beauty.* Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.
Natl. Kellastone Co., 155 East Superior St., Chicago, Ill.
United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

SURVEYORS' INSTRUMENTS—See Levels

SUSPENDED CEILING
United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.
186. *Loose-leaf Bulletins.* 8½ x 11. Jester-Saskett, consists of plaster board applied to metal channels with special clip, ready for plastering.



Handsome Garages

and many other home, yard and farm improvements are described in detail in the 104-page, illustrated Handbook, ALPHA CEMENT — How to Use It, which the ALPHA dealer will be glad to give you, free of obligation.

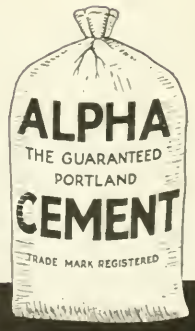
The ALPHA Service Sheets and Special Bulletins also give helpful building details on the following and dozens of other permanent cement improvements:

Walkways and Driveways *Foundation and Hatchway*
Storage Cellar *Ice House*
Barn and Silo *Posts and Walls*

A few pages of the ALPHA literature tell how we make ALPHA CEMENT by a system of hourly tests that enables us to guarantee every bag to meet standard specifications.

ALPHA PORTLAND CEMENT CO.
EASTON, PA.
140 South Dearborn Street, CHICAGO, ILL.

New York Boston Philadelphia Pittsburgh Baltimore
Battle Creek, Mich. Ironton, Ohio
Plants at: Alpha, N. J. Cementon, N. Y. Jamesville, N. Y. Manheim, W. Va.
Martins Creek, Pa. La Salle, Ill. Ironton, Ohio Bellevue, Mich.



use Alpha Cement

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 82*

THERMOSTATS—See Heating Equipment

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Building, Chicago, Ill.

187. *Handbook of Hollow Building Tile Construction.* 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.

National Fire Proofing Co., 250 Federal Street, Pittsburgh, Pa.

188. *Standard Wall Construction Bulletin* 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.

189. *Industrial Housing Bulletin* 172. 8½ x 11 in. Illustrated. Photographs and floor plans of typical workingmen's homes.

190. *Natco on the Farm.* 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.

TIMBER CLAMP

Schenk Timber Clamp Co., 501 Fifth Avenue, New York City.

TOILET PARTITIONS—STEEL

Hart & Hutchison, New Britain, Conn.

284. Write for this Catalog, describing the sanitary and durable usages of these partitions.

TOOLS

C. E. Jennings & Co., 321 Winthrop Avenue, New Haven, Conn.
Mack & Co., Rochester, N. Y.
Progressive Mfg. Co., Torrington, Conn.
Sargent & Co., New Haven, Conn.
Stanley Works, New Britain, Conn.
James Swan & Co., Seymour, Conn.
The L. & I. J. White Co., Buffalo, N. Y.

TRACTORS

C. H. & E. Mfg. Co., Milwaukee, Wis.

275. Bulletin No. 4, Tractors.

TRAILERS

Rogers Bros. Co., Albion, Pa.

TRANSITS (See Levels)

Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.

TRUSS LOOPS

The Bostwick Steel Lath Co., Niles, Ohio.

279. *"Beautiful Permanent Walls,"* 22-page illustrated catalog. 4 x 9 inches.

VENTILATION

Royal Ventilator Company, 415 Locust Street, Philadelphia, Pa.

193. *Descriptive Catalog* of round and rectangular ventilators made in galvanized iron, copper, etc. Illustrated.

E. G. Washburne Co., 207 Fulton Street, New York, N. Y.

194. *Illustrated Booklet* of metal ventilators, weather vanes, lightning rods, etc.

WALL BOARDS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

195. *Descriptive catalog and sample of Linabestos Wall Board* for interior construction. Flame-proof and fire-resisting wall board.

Beaver Board Co., Buffalo, N. Y.

196. *Illustrated folder,* describing various uses and the methods of handling Beaver Board to the best advantage. Samples with descriptive literature sent on application.

Compo-Board Co., 5778 Lyndale Avenue, North, Minneapolis, Minn.

199. *Catalog sent on request with sample.* Describes many uses of Compo-Board.

MacAndrews & Forbes, 200 Fifth Avenue, New York, N. Y.

200. *Folder.* Describing uses and application of Fiberlic Wall Board, together with sample of same sent to any address.

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

201. *Walls of Worth.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Describes Sheetrock, the fireproof wall board, its advantages and uses.

Upson Company, Lockport, N. Y.

WALL FURRING

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

202. *Thirty-two-page Booklet.* 8½ x 11 in. Pyrobar. Tile.

WATER HEATER

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WATERPROOFING—See also Dampproofing

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

206. *Science and Practice of Integral Waterproofing.* Pocket size. 33 pp. Illustrated. Contains full specifications for waterproofing MASS Concrete, stucco and Cement Plaster Coat. Entire chapter devoted to "Practical Application of Waterproofed Cement Plaster Coat."

207. *Technical Pamphlet No. 8.* Booklet. 4 x 7 in. 28 pp. A discussion of why concrete requires waterproofing and the properties an integral waterproofing must possess to operate effectively with the natural properties of concrete.

WATER SUPPLY SYSTEM

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WEATHER STRIPS

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.

239. Six-page illustrated circular, describing the product as used for Hotels, Residences and Institutions.

Diamond Metal Weatherstrip Co., Columbus, Ohio.

242. 34-page illustrated catalog. 8½ x 11¼ in. Containing blue prints of the various styles and sizes of Weatherstrip.

Monarch Metal Products Co., 5020-26 Penrose Street, St. Louis, Mo.

210. *Cause and Effect.* A series of pamphlets describing Monarch Metal Weather Strips, which are made of bronze, brass and zinc. They differ from all other strips in that they are applied in spaces around doors and windows as elastic fillers and not over the space as covers. Each 4 pp. 8½ x 11 in.

WEATHER VANES

E. G. Washburne & Co., 207 Fulton Street, New York, N. Y.

211. *Descriptive Catalog in Colors.* Showing two different designs of weather vanes, lightning rods, ventilators, etc.

WINDOWS—See Also Doors and Windows

The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.

280. BOCA steel sash. (E-22). A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.

Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.
Hope & Sons, Henry, 103 Park Avenue, New York.

212. *Catalog.* 12¾ x 8½ in. 30 pp. Illustrated. Full size details of outward and inward opening casements.

WINDOW CASEMENTS

The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.

281. BOCA steel sash. (E-22.) A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.

WINDOW HARDWARE

The Bridgeport Chain Co., Bridgeport, Conn.

266. *Interesting catalog* describing Sash Chains, Hooks and Sash Chain Attachments.

Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.
The Kawneer Company, Niles, Mich.

213. *Kawneer Semplex Windows.* Catalog. 8½ x 10½ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installations in residences and buildings of all sorts.

214. *Detail Sheets and Installation Instructions.* Valuable for architects and builders.

Monarch Metal Products Co., 5020 Penrose Street, St. Louis, Mo.

282. 16-page illustrated catalog, 4 x 9 in., on Window Casements.

National Mfg. Co., Sterling, Ill.
Pullman Mfg. Co., Rochester, N. Y.
Samson Cordage Works, Boston, Mass.
Catalog. 3½ x 6¼ in. 24 pp. Illustrated. Covers complete line.
Sargent & Co., New Haven, Conn.
Stanley Works, New Britain, Conn.

WOODWORKING MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.

217. *Contractors' Bulletin No. 77.* Describing various types of portable Variety Woodworkers. General catalog No. 22, describing a general line of woodworking machinery.

W. F. & John Barnes Co., 71 Rudy Street, Rockford, Ill.

218. *Catalog.* Containing description of rip and other machine saws, formers, mortises, tenoners, lathes. 38 pp. Illustrated.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.

219. *Catalog* of portable saw rigs, pumps, compressors, engines, etc. 48 pp. Illustrated.

The Crescent Machine Co., 259 Main Street, Leetonia, Ohio.

220. *Catalog.* Describing band saws, shapers, jointers, planers, borers, mortisers, etc. 144 pp. Pocket size. Illustrated.

R. E. Kidder Co., 35 Hermon Street, Worcester, Mass.

222. Catalog. Describing improved boring machine and how it can be used.

Parks' Ball Bearing Machine Co., Sta. "A," Cincinnati, Ohio.

223. *Illustrated Folder.* Describing Parks' Planing Mill Special, comprising circular saw, jointer, band saw, shaper, borer, tenoner, etc.

J. D. Wallace & Co., 1401 Jackson Boulevard, Chicago, Ill.

225. *Bulletin No. 219-K.* Describes portable electric punch machines, tools, planers, jointers, circular saw, etc.

Woodworkers Mfg. Co., 614 Bush Street, Detroit, Mich.

263. 18-*page illustrated pamphlet,* 10¾ x 7¾ in., called "The Master Woodworker." The Model No. 7 machine is described in detail.

THE BEST LUMBER
FOR THE OWNER OR THE INVESTOR TO PAY FOR IS
THE BEST LUMBER
FOR THE CARPENTER AND BUILDER TO USE.
Don't Forget That Good Reputations are Built on Good Recommendations. USE AND RECOMMEND
"TIDE WATER"
CYPRESS
"THE WOOD ETERNAL"
BECAUSE IT
LASTS & LASTS & LASTS & LASTS & LASTS & LASTS
Look for this on every board—
Accept no Cypress without this mark

The Remarkable Bonding Strength of Kellastone

THE disappointment frequently experienced in ordinary stucco construction is often due to the lack of affinity between the stucco and the surface to which it is applied. The natural result is cracking, falling off and eventual complete deterioration.

Kellastone forms a perfect bond with any of the construction surfaces in common use. It sticks so tightly that its removal or separation from any surface over which it has been applied is accomplished only with extreme difficulty. After it has been permitted to thoroughly set on an ordinary brick surface, it is difficult to remove without chipping the face of the brick.

Such remarkable bonding strength is conducive of the practically indestructible character of **Kellastone**, developing the longevity of service for which it has become famous on all types of construction.

Kellastone Interior Plaster is the hardest and strongest material available for this purpose. It attains 600 pounds per square inch tensile strength in thirty days. For this reason it is not necessary to apply it as heavily as ordinary lime and gypsum plasters. Can be applied to any surface, is fireproof and immune to water damage

Write for informative literature on Kellastone

NATIONAL KELLASTONE COMPANY

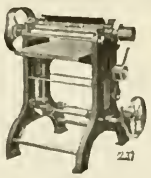
ROOM 517, 155 EAST SUPERIOR STREET :-: CHICAGO, ILLINOIS

New York Office
342 Madison Avenue

Pacific Coast Office
Porterville, California

Plants at
Waukegan, Illinois — St. Paul, Minnesota — Porterville, California

KELLASTONE
IMPERISHABLE STUCCO



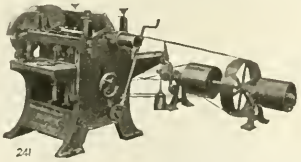
American "Jewel" Bench Planer



American "Variety" Tilting-Table Saw Bench



American "Universal" Saw Bench



American "Triumph" Planer, Matcher and Moulder

"Furnishes All Necessary Mill Work"

THAT is what Frederick Skon, a carpenter and builder of Jersey City, N. J., says about the American Contractors' Variety Woodworker.

His letter is as follows:

> "The Contractors' Variety Woodworker has proven very satisfactory in my shop. I cannot say what department the machine has proven most useful in, as the rip-saw, cross-cut saw, jointer and mortiser are in constant use by two men in my shop. I think it is sufficient recommendation for the machine to say it furnishes me with all necessary mill work."

Hundreds of contractors, builders and carpenters the country over voice the same enthusiasm, on the all around utility of the "American" Contractors' Variety Woodworker.

Put an "American" in your shop and from the start it will prove a dividend paying investment in time and labor saved and volume of work turned out.

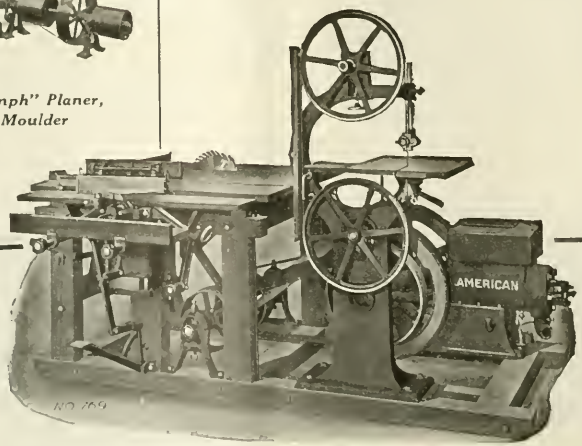
Write for Bulletin No. 77 that fully describes the "American" Contractors' Variety Woodworker and our line of woodworking machinery.

American Saw Mill Machinery Company

Hackettstown, N. J.
62 Main Street

New York, N. Y.
1362 Hudson Terminal Bldg.

American
Woodworking Machinery



Furnished with Built-in Gasoline Engine, Self-Contained Electric Motor or for Belt Drive.

Portable Variety Woodworker with 20-Inch Band Saw.

BUILDING AGE

AND

THE BUILDERS' JOURNAL

NEW YORK, SEPTEMBER, 1922



BEAUTY BY GROUPING HOMES

NOT enough attention is being paid to the grouping of buildings. We too often find that some buildings do not harmonize with their neighbors on either side and perhaps they in turn do not harmonize with the others. The result is an unfortunate muddle as far as real beauty goes.

During the past few years more attention has been paid to this important subject and a good deal of improvement is already to be noticed in the newer developments. The bungalow court idea is spreading and buildings are now being grouped so that from any angle a picture is obtained.

Our first illustration shows quite an artistic grouping of five two-story dwellings. An enlarged picture of the building at the rear of the group is next given. This interesting design for a home forms the background for the court. In this particular group of five buildings, it will be noticed that while each is different, still the general form and placing is harmonious to all. There is a central path with two light standards which serve to illuminate the court at night.

There is no crowding, plenty of space has been left between the fronts of the buildings so that parties living in the rear may have a view of the street.

The reader can see in the third picture another artistic grouping of homes which really form a small park. Only one-half of this interesting development is shown but it indicates what may be had.



Close-Up View of House at Back of Court

Many, of course, start out to do the right thing, but by reason of no experience or lack of artistic judgment the result fails of its purpose as will be noticed in our fourth picture. Here is a group of eight bungalows placed with a very narrow space between them, the idea is good, but the close proximity of the houses deprives each occupant of privacy.

One could hardly speak in one of the front rooms without having the neighbor across the court hear every word. Had these same houses been placed about fifty feet apart, this disagreeable feature would have been avoided and there would be the chance of introducing a handsome garden between that all could enjoy.

Our fifth picture shows quite an artistic handling of a group of ten semi-detached houses. Here a beautiful parked space is laid out, which is sufficiently illuminated at night by a single lamp standard placed in the central path. Each separate doorway however has its own light so at night the court is very effectively and artistically illuminated. In line with this light standard in the rear is a little fountain which adds to the harmony of the entire development; it is beauty added at small cost.

So much depends on design and harmony of the grouping that it will be of interest to quote from the book of Small Houses by Ernest Flagg, the noted architect, who certainly is a master of design:

ONE of the best ways to economize in building is to economize on ugliness. A good-looking house will rent better, sell better, be pleasanter to live in, and altogether worth more than if ugly.

Nothing can be of greater service in avoiding ugliness than a knowledge of the principles of design. Acquaintance with even a few of them will aid powerfully in that respect. If the chief rules of good design were understood by the masses as they might be, nothing would do more to promote beauty, improve workmanship, add to the value of manufactures, and in many other ways further the general welfare and prosperity of the country. They are simple, easy to acquire, and should be taught with the alphabet.

When one understands the principles of design, his taste will have something more solid as a basis than mere whim or fancy, which in the untutored is more likely to be bad than good. He will know what is right and why it is right. Acquainted with the rules of good design, he will not accept articles made in defiance of them. Therefore, if this knowledge were general, all products dependent on design would be elevated and improved in quality, and find readier and wider markets.

The neglect of this study in the United States is astonishing. How few people, even among the supposedly well educated, can give an intelli-



Charming Grouping—Only Half of Court Shown

gent explanation of the qualities of a design!

Most of the qualities of good design may be broadly classed under two heads, viz., essential and desirable—the desirable ones being those which reflect the character and personality of the artist, and the essential ones those which are necessary in order that the design may be worthy to be classed at all as a work of art.

Among the essential qualities are reason, unity, harmony, clarity, and variety.

Among the desirable qualities are imagination, interest, refinement, simplicity, dignity, and style.

A design may be good which conforms to requirements of the kind mentioned in the first list, but cannot be great unless endowed with other qualities partaking of a personal nature, as illustrated by the second.

In the human figure as it approaches perfection—nature's supreme production—is contained the sure guide for the determination of all true principles of design. In it may be found the exemplification of all the above-mentioned qualities except imagination, which is spiritual, and many more besides. So in stating the rules of art one has simply to record what is there revealed. The study of the best specimens of the human form is, therefore, of the utmost importance in the refinement of taste, and it was because the ancient Greeks realized this truth that they excelled all others in art.

Harmony is essential in design as it is in music; it is all-embracing and should reign throughout—harmony in purpose, harmony in dimensions, harmony in form and harmony in color. In good design discord can have no place. Harmony of dimensions is proportion. In good design there is an agreeable and fitting relationship between all dimensions. In like manner harmony must exist in all other matters, whether of form, color, purpose, or other element entering into the design, so that all may unite to form a complete, harmonious, and well-rounded composition; of which the human figure affords the best example.



Too Close for Comfort or Beauty

IT is hard to change long established building habits; such habits sometimes endure for ages in certain localities with little or no change. It is, however, easy for new communities to acquire bad building habits. When the necessity for shelter is great and the means of obtaining it scant, flimsy and makeshift methods of building find ready acceptance; and once introduced are hard to eradicate. Such habits, formed here in early times, still influence construction, as is abundantly proved by our inordinate fire loss; fully ten times greater than where building is done with a little more care.—ERNEST FLAGG.



Nothing Pretentious, but Pleasing and Dignified



Apartment House *of* Novel Design

"The Helene" Located at Miami, Florida

HAMPTON & REIMERT, Architects

RATHER unusual is the design of this apartment house—a splendid exposition of the combined Spanish and Moorish with just enough ornamentation in the way of old, hand-made Spanish tile, wrought iron grille and unique balconies to add to its quiet dignity.

The construction is of reinforced concrete piers and girders with hollow tile curtain walls, the exterior being covered with stucco in a two-tone finish. Stairways and gallery are of concrete. The latter as well as all walks in the court surrounding the fountain, give access to the first floor apartments, being laid with 6 x 6" quarry tile.

Much credit is due to the contractor, Mr. Charles S. Ewing, of Miami, for the production of a first class job of construction work.

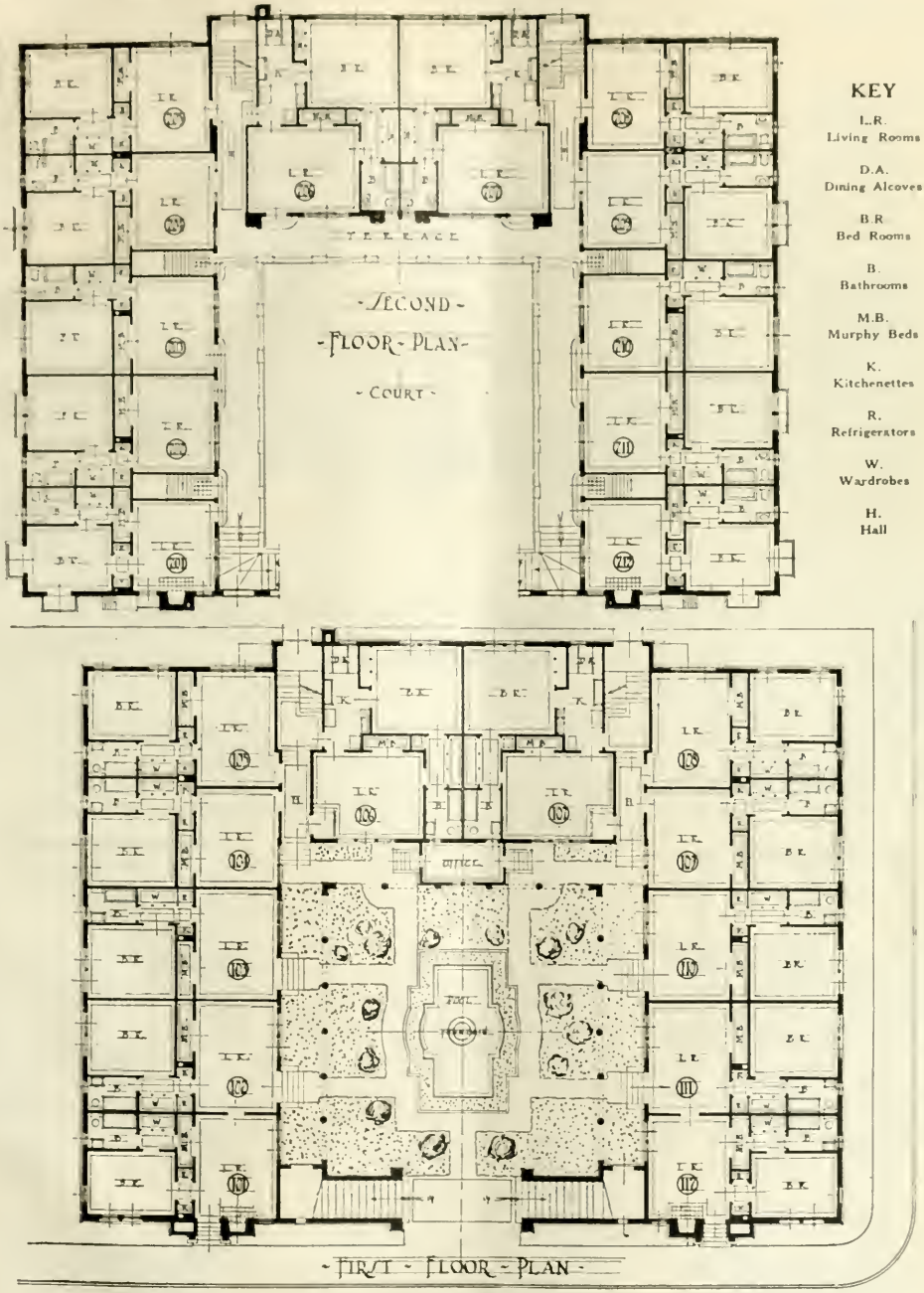


A Gasoline Operated Hoist and Concrete Mixer Were Found to Be Indispensable for Economical Operation on This Job.

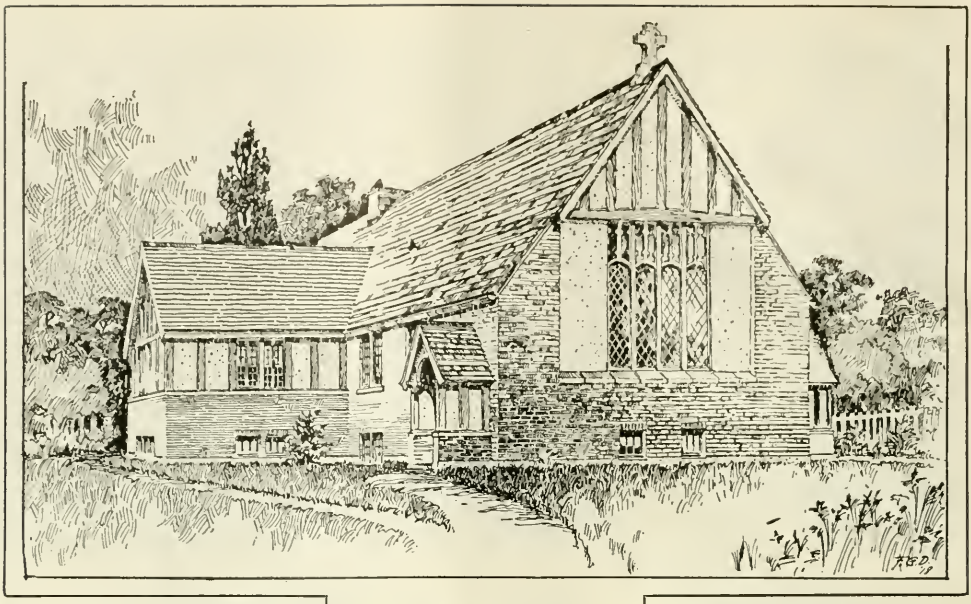
This apartment house was specially designed to be rented furnished to winter guests at this popular winter resort.

The general color scheme of the whole of the interior is a soft French grey, though each floor has its own distinctive tone and its own period furniture. Several apartments are equipped with fireplaces. The others are heated by electricity, whenever the need is felt to remove the slight occasional chill.

It being assumed that most of the patrons will hardly care to be bothered with cooking, only six of the apartments have been provided with full culinary equipment. These apartments have electric ranges, built-in kitchen cabinets, with dining alcove. The remaining thirty apartments have small electric grills.



Floor Arrangement of The Helene Apartments, Charles S. Ewing, Builder



Small Village Church

RECENTLY a committee was appointed by the Episcopal Church in the United States to give a report regarding church architecture. A large number of photographs of existing edifices were taken and these were carefully examined by a committee.

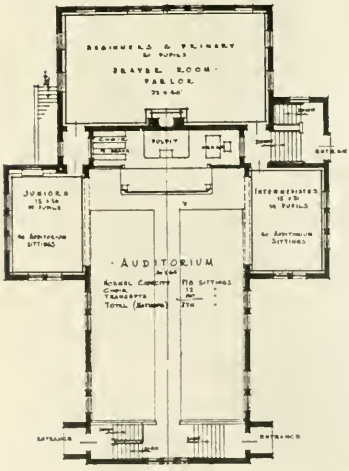
The examination disclosed a rather poor quality of art displayed in the erection of most of the churches. The committee recommended the establishment of a course in church architecture for divinity students so that later ministers would have the ability to judge what would be good.

Some years ago the Methodist Episcopal Church established a bureau of architecture in Chicago and by the aid of this bureau many congregations have been guided in the right path by erecting creditable looking buildings.

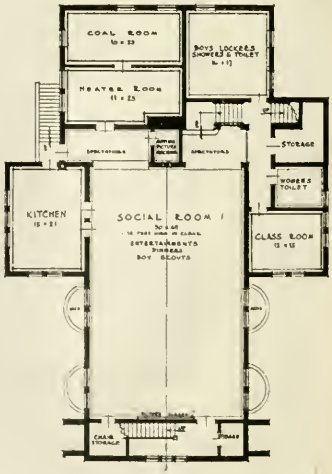
The design shown here was prepared by this bureau for a small rural community church. The basement hall can be used for games, meetings and other recreations; a kitchen is attached to it for the preparation of refreshments, etc. Proper space is given over to the heater room and coal storage. A moving picture booth is arranged as part of the structure, being of fireproof construction, and on each side of it there is a platform for visitors. Toilets, storage space etc., occupy the basement.

There is one feature of this layout that will commend itself, and that is the number of exits provided from this basement meeting room, there being four separate stairs.

The exterior of this church design is worthy of special commendation. It is English in character and is to be built of brick and stucco, with half timber work.



Floor Plan



Basement Plan

METHODS OF FINANCING THE BUILDING OF HOMES

Different Sources of Obtaining Building Capital Discussed, Showing that the Building and Loan Association is Vital to the Building Industry

By K. V. HAYMAKER
Sec.-Treas. Detroit Home Builders' Savings & Loan Company

TIS said that seven Grecian cities dispute the honor of claiming to be the birthplace of Homer. We have about three or four different cities claiming to be the home of the largest building and loan association in America, but the real claimant entitled to the honor has not been named. The biggest building and loan association in America today is the Railroad Men's Building & Loan Association of Indianapolis with between twenty-three and twenty-four million dollars of assets.

This whole conference is based on the fact which we all recognize and all acknowledge, that some efficient practical means must be obtained, must be arrived at, by which we can satisfy the hunger for homes that is felt in every community in America. You realtors all know that you don't get far in any sale of a home until you come to the question, how is this deal going to be financed?

Now, in almost every instance when a man starts out to buy a home, or to build a home, he lacks sufficient money to pay the entire cost. That gap between his available cash and the cost of the property must be bridged by some form of credit, and that credit almost invariably takes the form of a mortgage loan. Hence it becomes a vital necessity for you individually in your business to have available an ample, abundant, reliable supply of money ready for investment in mortgage loans. In the last few years there has been a wonderful change in the methods of doing business in all lines. In none of them has there been a greater change than in mortgage loans.

WE have had heretofore, four sources from which we secured funds with which to finance mortgages. First, private investments Under the present income tax law with its heavy income tax and its mounting surcharges, the income from large estates and from men of great wealth, is no longer being invested in mortgage loans.

For example, some years ago, Hetty Green, said to be the wealthiest woman in America, died, and when her son inherited the estate and came to invoice it, he found almost every dollar of it invested in mortgage loans, about fifty million dollars, and when he came to get the returns, he found that after he had paid the income tax with its high surcharges, he was getting less than one per cent on his money. He at once sold his entire holding of mortgage loans and invested in other securities. That is just one example. Thousands and scores of thousands of wealthy investors who have left the mortgage loan market are no longer buying mortgages.

> THE business men of America in all lines of big business are beginning to appreciate the fact that the building loan association is a co-worker and co-operator with them, and that it is to their interest as well as to the interest of the public. This is not altruism. It is to their own selfish interest, to help along the building and loan association in their home town.

Then the second are the insurance companies. What is true of the individual investor is largely true of the insurance companies. There are two or three or four perhaps prominent exceptions to that rule, the Metropolitan represented by the first speaker, Mr. Cody, is one which is doing a magnificent work in financing home building loans.

The Equitable of New York has another home purchase plan which is available in many instances. The Prudential of Newark, New Jersey, is another that is investing in mortgage loans in small amounts, in reasonable amounts that help the home builder, but taken in the aggregate the insurance companies of America are curtailing their mortgage investments. Some thirty years ago 58 per cent of the assets of the life insurance companies of America was under the head of mortgage loans. Today it is less than thirty per cent of their assets that is invested in that type of security.

The third item, the third source from which money for mortgages was obtained was the commercial banks and the savings banks and trust companies. Today you will find that there are many of them, perhaps a majority of these banks and trust companies, that are not interested in mortgage loans. Several causes lead to that. First, these commercial banks and savings banks and trust companies are financing the commercial and the industrial and the transportation business of the country and as this financial depression from which we have been suffering is passing away and as the industry of the country is going to develop and spread and increase, it will take all the resources of all those institutions to finance that business on the short time commercial paper which is so much more profitable than the frozen credits of the mortgage loans, that the banks are not investing in mortgage loans to the extent that they formerly did.

Another most important reason why you will never again see the banking interest of America invest in mortgages in the future as they have in the past grows out of the effect of the Federal Reserve System.

Now the advantage which a bank gets by affiliating with the Federal Reserve System is that it affords a place where they can rediscount their paper, but the paper which they can rediscount in the Federal Reserve Bank must be short time commercial paper. They can't rediscount long time paper. They can't rediscount mortgage paper at all, and for that reason all these institutions, if they affiliate with the Federal Reserve System, will curtail their mortgage investments in order to supply the more profitable business of financing the short time commercial paper.

THEN there is a fourth source from which mortgage loans have been obtained and that is the building and loan system. Unless your attention has been called to it you may not appreciate the magnitude of the building and loan association interests of America. Do you know there are more building and loan associations in America than there are national banks? Do you know this further fact, that the actual cash paid in to the building and loan associations on their capital stock in America is almost double the combined capital stock of all the national banks in America? They have between two and one-half and three billion dollars of gilt-edged securities in their vaults.

A few months ago Mr. Fiske, the president of the Metropolitan insurance Company, made a statement at a meeting of the Life Insurance Presidents' Association, as a boast, that in the year 1920 the combined life insurance companies of America made mortgage loans to the extent of $237,000,000. That is a tremendous pile of money. $151,000,000 of that was on farm loans and about $78,000,000 was on city property, and it is a matter of common knowledge that many of the loans made by these insurance companies on city property were on office and apartment buildings and structures of that character which did nothing toward improving the housing conditions in America.

It is a liberal estimate to say that the combined life insurance companies of America in that year did not loan to exceed $50,000,000 on homes in America. Compare that, with what the building and loan associations of America did in that same year when they loaned $550,000,000 in America. So many people have an idea that the building and loan association is a little two by four sort of an institution where children save their pennies, and where the working man saves the dollars and dimes that they can pinch out of their savings.

> EACH line of business should co-operate with every other to stimulate the growth and swell the assets of the building loan associations, and in so doing will not only advance their own interest and make their own business bigger and more profitable but at the same time will be doing a great public service in helping to make this country a better place to live in.

Support and back up the building and loan association in your own home town. If you haven't got one, go out and organize one.

SOME years ago I was employed by the National Association of Lumber Manufacturers to travel all over the country. I made a tour of some 15,000 miles from Albany, New York, to Great Falls, Montana, and from Minneapolis and Milwaukee to Dallas, Texas and New Orleans. My message to the lumber dealers of America was that they should get behind the building and loan associations, because every time a building and loan association made a loan in their home town it meant the sale of a bill of lumber, it meant business for them, and as a result of that tour, more than one hundred building organizations were organized in America by the lumber dealers, getting their neighbors around them and organizing an association to build up the community in which they were operating.

Last month they had a big meeting down in Chicago, the American Lumber Congress. A Kansas City man. Mr. James R. Moorehead, read a paper on this subject, and he prefaced his paper by telling this story:

He said, "After I got my paper ready for this convention, just as I was about ready to take the train, I called up my son in Lexington, Missouri, who is running a lumber yard.

"I said, 'Hello, son. What are you doing down there? Any business coming in?

"'Yes, nice business this morning.'

"What did you do?

"'I sold a bill of lumber for a house down here to John Smith. He is going to build over on Elm street.'

"Well, did you get your money?

"'Sure I got the money.'

"Where did Smith get the money?

"'Out of the Building and Loan.'"

Mr. Moorehead said that he sold that bill of lumber thirty years ago when he organized that building and loan association there, and the story, his boy told him over the telephone that morning, has been repeated in greater or less degree every week, and sometimes a half dozen times a week during this whole thirty years. Mr. Moorehead said that the best stroke of business he ever did was when he organized that building and loan association.

Does that convey any lesson to you realtors? Don't you know that every time a building and loan association makes a loan to a man it increases the value of the property all around you? Perhaps you even get the money with which he buys the lot. Now isn't it up to you to back up these building and loan associations and help to make them popular and help to finance them in the efforts which they are putting forth?

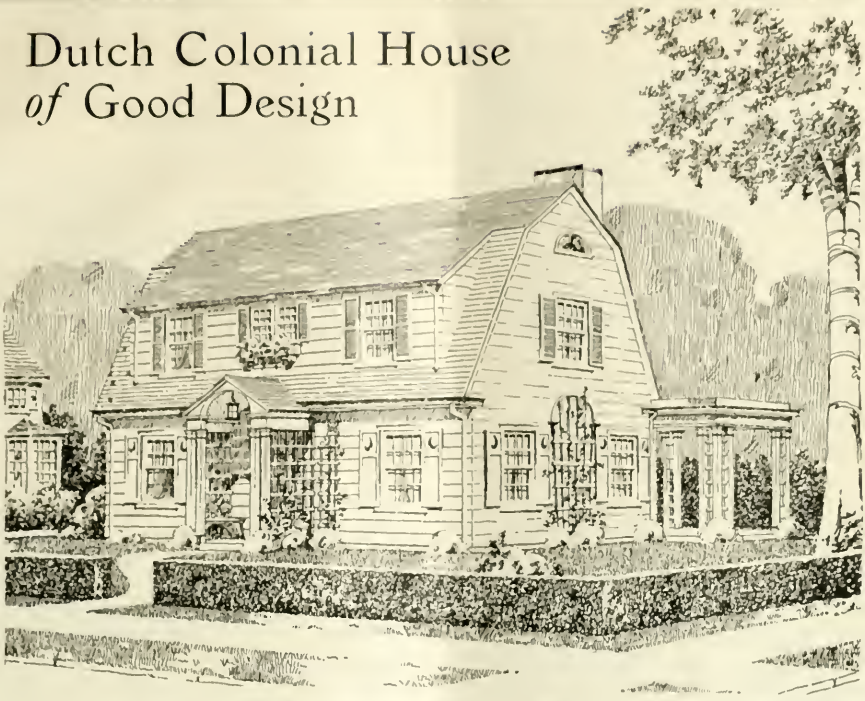
ONE of the most hopeful signs in our current events is the growing spirit of co-operation and mutual helpfulness which is so rapidly growing up in all lines of business.

The great problem of providing adequate funds for financing the great program of home building with which our country is confronted is of vital importance not only to the public at large but to every line of business which must take part in the work.

Each one of these lines of business is vitally interested in the building association which must be the source from which the funds come to finance all these various steps which convert the wandering, rent-paying tenant into a home-owning, home-loving, patriotic citizen.

[Extracts from an address delivered before the National Association of Real Estate Boards during the Conference on Realty Financing held in San Francisco, Cal.]

Dutch Colonial House *of* Good Design



DUTCH Colonial is a style well adapted to the modest American house and the architects have carried out the style in every detail for the house shown herewith.

A house of this type fits well in most any locality since it violates no rules of precedent or of good design. The house is thoroughly practical and economical, too.

Although the house is of the cottage type with the roof brought down to the first story, the broad dormers give a full second floor —beauty and utility combined.

The living porch is arranged on the corner at the rear of the living room and extends by the house on all sides. This gives a good front view as well as giving a view to the side and rear, it insures the benefit of all summer breezes no matter which way the wind blows. The porch has an open fireplace served by the same chimney as the living room fireplace.

The entrance porch has latticed sides and seats, giving an inviting appearance; it bids one enter. Too often we see small houses that boast cold, forbidding doorways of solid wood without porches or seats, suggestive of feudal times when the chief consideration was to keep out hostile persons. With our modern methods of living this type of entrance does not seem fitting; an entrance that bids one welcome is far better.

The windows of this house have small panes and heavy muntins, characteristic Dutch Colonial detail. The windows are large and well proportioned.

The plans show a good arrangement of rooms about a center hall. One has to search to find a bit of space that has not been utilized to the best advantage, in fact, there is none.

On the second floor are three main bed rooms, each with cross ventilation; a maid's room that is fitted with a lavatory; a bath room and abundant closet space.

A clothes chute extends from the second floor to the laundry in the cellar. The construction is estimated to cost about $8,400.

SEVEN ROOM HOUSE

Specially Designed for
BUILDING AGE
and
THE BUILDERS' JOURNAL

by R. C. HUNTER & BRO.
Architects New York

Quantity Survey *of* Dutch Colonial House

Shown on Preceding Page

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc. Minor outs have been disregarded.

Such items as clearing site, temporary work and protection, scaffolding and general equipment and supplies, have not been included.

Such items as are marked "Unit," are to be estimated in a lump sum, following requirements of plans and specifications.

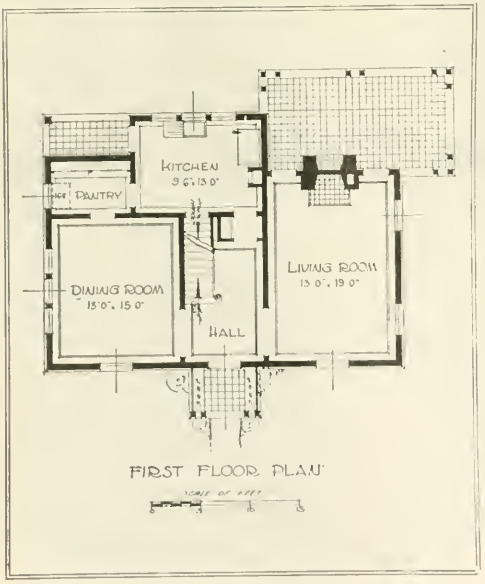
Excavation

(Excavation for pipe trenches not included)

Excavation for cellar	240	cu.	yds.
Excavation for footings	15	cu.	yds.
Excavation for areas	16	cu.	yds.
Excavation for trench walls	14	cu.	yds.
Excavation for leader drains and dry wells	10	cu.	yds.
Backfilling around walls, etc.	42	cu.	yds.
Leaders, drains and dry wells—			
Field stone for dry wells	8	cu.	yds.
4 in. salt glazed tile drain pipe	30	lin.	ft.
4 in. elbows	5		

Masonry

Concrete for cellar walls	862	cu.	ft.
Concrete for footings	272	cu.	ft.
Concrete for trench walls	250	cu.	ft.
Concrete for area walls	138	cu.	ft.
Cellar floor, (3 in. concrete and 1 in. cement finish)	706	sq.	ft.
Outside cellar steps (concrete, cement faced)	40	sq.	ft.
Area bottoms (brick and sand)	37	sq.	ft.
Porch floors (12 in. cinders, 3 in. concrete and brick finish)	253	sq.	ft.
(with cement finish in place of brick)	35	sq.	ft.
Concrete Forms	2200	sq.	ft.
Pointing cellar window sills	14	lin.	ft.



Brick Work

Common brickwork for chimney (or 3.25 M.)	161	cu.	ft.
Face brick for hearth and jambs and breast in Living Porch (or 588 brick)	84	sq.	ft.
Fire brick for fireplaces (or 150 brick)	30	sq.	ft.
8 in. x 12 in. T. C. flue lining	78	lin.	ft.
3 in. bluestone chimney cap (2 ft.-0 in. x 3 ft.-6 in.)	1		

Mason's Iron Work

Fireplace damper (3 ft. 0 in. opg. with throat, etc.)	1		
Fireplace damper (2 ft. 8 in. opg. with throat, etc.)	1		
C. I. ash dump	2		
C. I cleanout door for ash pit (16 in. x 12 in.)	1		
C. I. cleanout door for boiler flue (8 in. x 8 in.)	1		
Thimble for boiler flue	1		

Plastering

Three coat patent plaster on metal lath, Gross (Net 550 sq. yds.)	670	sq.	yds.
G. I. corner beads	80	lin.	ft.

Tile Work

Tile work for Bath Room—			
Floor (1 in. hex. white)	40	sq.	ft.
Wainscot (3 in. by 6 in. white wall tile)	94	sq.	ft.
6 in. sanitary base	24	lin.	ft.
Moulded cap	24	lin.	ft.

Sheet Metal Work

Tin roof on porches	250	sq.	ft.
Tin roof on dormer	83	sq.	ft.
Tin flashing for roofs, etc.	142	lin.	ft.
Tin flashing for column caps	16	caps.	
Tin flashing and counter flashing for chimney	12	lin.	ft.
Chimney cricket	6	sq.	ft.
Valley lining	45	lin.	ft.
4 in. half round hanging gutter (G. I.)	82	lin.	ft.
3 in. dia. tin leaders	76	lin.	ft.
Bends for same	17		
Gutter thimbles	9		
3 in. x 4 in. G. I. gas range vent	16	lin.	ft.
Cap and thimble for same	1		

Carpentry

TIMBER			
All No. 1 common stock, hemlock, rough unless noted.			
Cellar girders—			
6 in. x 10 in. spc.—1/16, 1/14, 1/12	210	F. B. M.	
2 in. x 3 in. nailer—80 lin. ft.	40	F. B. M.	
Sills—			
4 in. x 6 in.—4/14, 5/12, 2/10	272	F. B. M.	
Posts—			
4 in. x 6 in.—7/12, 4/8	232	F. B. M.	
Studs, girts and plates, 1st. floor—			
2 in. x 4 in.—111/10, 69/8	1108	F. B. M.	
Studs, etc., 2nd. floor—			
2 in. x 4 in.—246/8	1311	F. B. M.	
1st. floor joists—			
2 in. x 10 in.—34/14, 20/8	1060	F. B. M.	
2nd. floor joists—			
2 in. x 10 in.—36/14, 24/8	1160	F. B. M.	
2nd. floor ceiling beams—			
2 in. x 6 in.—10/14, 21/12, 33/8	656	F. B. M.	

BLUE Print Plans and Specifications of many Beautiful Homes of Moderate Cost can be supplied at a nominal price by Building Age and The Builders' Journal, New York.

Carpentry—Continued

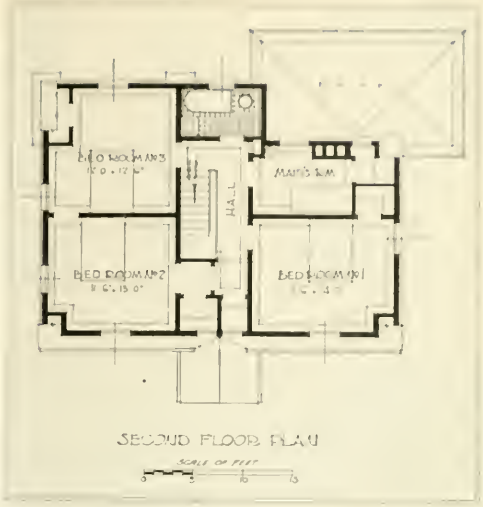
Rafters			
2 in. x 6 in.—10/14, 34/12, 8/10, 15/8.	832	F. B. M	
Ridge—			
2 in. x 8 in.—2/12, 1/14	51	F. B. M	
Living porch rafters—			
2 in. x 6 in.—12/10	120	F. B. M	
3 in. x 8 in.—2/16, 1/10	84	F. B. M	
Living porch ceiling beams—			
2 in. x 4 in.—14/10	94	F. B. M	
Plates—			
2 in. x 10 in.—4/12, 4/10	147	F. B. M	
Col. cores—			
2 in. x 3 in.—15/8	60	F. B. M	
Floor bridging—			
2 in. x 2 in.—350 lin. ft.	117	F. B. M	
Cornice outlookers—			
2 in. x 4 in.—60 lin. ft.	40	F. B. M	
1 1/4 in. x 6 in.—50 lin. ft.	50	F. B. M	
Cellar partitions, studs—			
2 in. x 4 in.—12/14	112	F. B. M	
Sheathing (7/8 in. x 8 in. shiplap)			
Walls—to cover	2050	sq. ft.	
Flat roofs—to cover	340	sq. ft.	
Sheathing paper (waterproof)	2200	sq. ft.	
Shingle lath—			
7/8 in. x 3 in.	3000	lin. ft.	
Grounds—			
3/4 in. x 2 in. surfaced one side	2500	lin. ft.	
Sheathing for cellar partitions—			
7/8 in. x 8 in. shiplap—to cover	190	sq. ft.	
Rough flooring (7/8 in. x 8 in. shiplap)—			
1st. and 2nd. floors—to cover	1500	sq. ft.	
Furring (7/8 in. x 2 in.)	400	lin. ft.	
Shingle roofs (18 in. stained shingles)			
14.11 squares	9750	shingles	
Shingle sides (24 in. stained)			
17.6 squares	5800	shingles	

Exterior Finish

Watertable (7/8 in. x 2 in. strip)	125	lin.	ft.
Main cornice—			
5 in. crown mould	75	lin.	ft.
7/8 in. x 4 in. fascia	70	lin.	ft.
2 in. bed mould	65	lin.	ft.
5/8 in. x 4 in. M. & B. ceiling—to cover	70	sq.	ft.
Raking cornice—			
4 in. mould	136	lin.	ft.
Dormer cornice—			
7/8 in. x 6 in. fascia	62	lin.	ft.
7/8 in. x 6 in. soffit	62	lin.	ft.
1 1/2 in. bed mould	62	lin.	ft.
2 in. fascia mould	18	lin.	ft.

Porch Finish

Entrance Porch—			
4 1/2 in. x 4 1/2 in. box cols. 7 ft. 8 in. long, with cap and base	4		
Portable seat, 1 ft. 6 in. high x 4 ft. 0 in. long, no back	2		
Lattice panels, 4 ft. 6 in. x 7 ft. 6 in.	2		
Lattice panels, 2 ft. 0 in. x 9 ft. 0 in.	2		
5 in. crown mould	8		
4 in. fascia	22	lin.	ft.
2 in. bed mould	24	lin.	ft.
7/8 in. x 8 in. frieze	23	lin.	ft.
7/8 in. x 3 in. frieze	23	lin.	ft.
7/8 in. x 4 in. soffit	13	lin.	ft.
1 1/2 in. neck mould	23	lin.	ft.
5 in. raking crown mold	10	lin.	ft.
5 in raking fascia	10	lin.	ft.



Front fascia piece 2 ft. 0 in. x 7 ft. 0 in.	1		
5/8 in. x 2 1/4 in. M. & B. ceiling—to cover	45	sq.	ft.
5/8 in. x 7/8 in. cove	15	lin.	ft.
Living Porch—			
4 1/2 in. x 4 1/2 in. box cols. 7 ft. 8 in. long, with cap and base	11		
Lattice panels, 1 ft. 0 in. x 7 ft. 8 in.	7		
5 in. crown mould	52	lin.	ft.
4 in. fascia	52	lin.	ft.
2 in. bed mould	48	lin.	ft.
7/8 in. x 8 in. frieze	96	lin.	ft.
7/8 in. x 3 in. frieze	96	lin.	ft.
7/8 in. x 8 in. soffit	48	lin.	ft.
7/8 in. x 4 in. soffit	48	lin.	ft.
1 1/2 in. neck mould	96	lin.	ft.
5/8 in. x 2 1/4 in. M. & B. ceiling—to cover	185	sq.	ft.
5/8 in. x 7/8 in. cove	48	lin.	ft.
Rear Porch—			
8 in. x 8 in. box col. 7 ft. 8 in. long, with cap and base	1		
Lattice panel, 1 ft. 6 in. long x 7 ft. 8 in. high	2		
Lattice panel, 3 ft. 2 in. long x 7 ft 8 in. high	1		
2 in. bed moulds	13	lin	ft
7/8 in. x 8 in. frieze	26	lin.	ft.
7/8 in. x 3 in. frieze	26	lin.	ft.
7/8 in. x 8 in. soffit	26	lin.	ft.
1 1/2 in. neck mould	26	lin.	ft.
5/8 in. x 2 1/4 in. M. & B. ceiling—to cover	27	sq.	ft.
5/8 in. x 7/8 in. cove	23	lin.	ft.
Cellar Bulkhead—			
7/8 in. x 6 in. M. & B. ceiling—to cover	46	sq.	ft.
7/8 in. cove	18	lin.	ft.
Lattice Panel—			
4 ft. 0 in. x 10 ft. 6 in.	1		
Louvres—			
1 7/8 in. fixed slats, frames, outside trim, etc. Wire screens on back—			
2 ft. 6 in. wide x 1 ft. 3 in. high, curved head	2		
Windows—			
Frames complete with sash, outside trim, etc. Sash 1 1/2 in. thick, glazed D. T.			

Cellar Windows—
Trim both sides.
Single, top hung casem sash, 3 ft. 0 in. x 2 ft. 0 in., 4 light..... 5
Mull. D. H. sash ea. 2 ft. 6 in. x 3 ft. 2 in., 12 light..... 1
First Floor Windows—
Single D. H. sash, 3 ft. 4 in. x 5 ft. 0 in.—16 light..... 2
Single D. H. sash, 3 ft. 2 in. x 5 ft. 0 in.—16 light..... 2
Triplet D. H. sash, ea. 2 ft. 6 in. x 3 ft. 2 in.—12 light..... 2
Single D. H. sash, 2 ft. 6 in. x 3 ft. 2 in.—12 light..... 1
Second Floor Windows—
Single D. H. sash, 3 ft. 0 in. x 4 ft. 6 in.—16 light..... 5
Single D. H. sash, 2 ft. 8 in. x 4 ft. 6 in.—12 light..... 2
Mull. D. H. sash, ea. 2 ft. 0 in. x 3 ft. 6 in.—12 light..... 1
Single D. H. sash, 2 ft. 6 in. x 3 ft. 2 in.—12 light..... 1
Single Casem. sash, 1 ft. 8 in. x 2 ft. 0 in.—4 light..... 1
Shutters—
1 1/8 in. thick. solid paneled.
3 ft. 4 in. x 5 ft. 1 in. pr..... 2 pr.
3 ft. 2 in. x 5 ft. 1 in. pr..... 2 pr.
2 ft. 6 in. x 3 ft. 3 in. pr..... 5 pr.
Blinds—
1 1/8 in. thick, fixed louvres, etc.
3 ft. 0 in. x 4 ft. 7 in. pr..... 5 pr.
2 ft. 8 in. x 4 ft. 7 in. pr..... 2 pr.
2 ft. 0 in. x 3 ft. 7 in. pr..... 1 pr.
2 ft. 6 in. x 3 ft. 3 in. pr..... 1 pr.
Exterior Door Frames—
1 3/4 in. thick rabbeted, complete with outside trim.
Front extrance door frame, 3 ft. 2 in. x 6 ft. 8 in. with 3 ft. 2 in. x 1 ft. 0 in. trans sash..... 1
Frame for door to Living Porch, 2 ft. 8 in. x 7 ft. 0 in..... 2
Frame for rear ent. door, 2 ft. 8 in. x 7 ft. 0 in..... 1
Exterior Doors (all to detail)—
Front extrance door, 3 ft. 2 in. x 6 ft. 8 in. x 1 3/4 in..... 1
Door to Living Porch, 2 ft. 8 in. x 7 ft. 0 in. x 1 3/4 in. glazed D. T..... 2
Rear ent. door, 2 ft. 8 in. x 7 ft. 0 in. x 1 3/4 in. glazed D. T. and paneled... 1
Finished Flooring—
Kitchen and Pantry, No. 1 Maple, 13/16 in. x 2 1/4 in.—to cover..... 163 sq. ft.
Living Room, Ent. Hall and Dining Room, plain sawed white oak, 13/16 in. x 2 1/4 in.—to cover..... 514 sq. ft.
Second Story, plain sawed white oak, 13/16 in. x 2 1/4 in.—to cover..... 645 sq. ft.
Lining paper under floors..... 1300 sq. ft.
Slat floor under laundry tubs, 3 ft. 0 in. x 4 ft. 0 in..... 1
Cement filled pipe cols. in cellar, 4 in. dia. x 7 ft. 6 in. long, with cap and base..... 5
Joist hangers (1/4 in. x 2 in. W. I.)
for 2 in. x 10 in. beams..... 6
for 4 in. x 10 in. beams..... 6

Interior Finish

Door trim (whitewood)—
7/8 in. jambs, 1/2 in. stops, 7/8 in. x 4 1/4 in. moulded and mitered trim. Trim both sides.
For doors, 2 ft. 6 in. x 6 ft. 10 in..... 3 sets
For doors, 2 ft. 4 in. x 6 ft. 10 in..... 1 set
For doors, 2 ft. 6 in. x 6 ft. 8 in..... 5 sets
For doors, 2 ft. 4 in. x 6 ft. 8 in..... 5 sets
For doors, 2 ft. 2 in. x 6 ft. 8 in..... 1 set
Trim for cellar doors (plain)—
For door, 2 ft. 8 in. x 6 ft. 6 in..... 1 set
For door, 2 ft. 6 in. x 6 ft. 6 in..... 1 set
Trim for inside of exterior doors—
Front entrance, 3 ft. 12 in. x 6 ft. 8 in. with trans..... 1 set
Rear entrance, 2 ft. 8 in. x 7 ft. 0 in... 1 set
Doors to living porch, 2 ft. 8 in. x 7 ft. 0 in..... 1 set
Trimmed openings finished same as for doors—
Opg. 5 ft. 0 in. x 6 ft. 10 in..... 2 sets
Arch openings—
Opg. 2 ft. 6 in. x 7 ft. 0 in..... 1 set
Opg. 2 ft. 8 in. x 7 ft. 0 in..... 2 sets
Window trim (whitewood)—
7/8 in. x 4 1/4 in. moulded and mitered trim. 1/2 in. stops. 1 1/8 in. moulded stool. 7/8 in. moulded apron. 5/8 in. x 7/8 in. cove under stool.
For windows, single, 3 ft. 4 in. x 5 ft. 0 in..... 2 sets
For windows, single, 3 ft. 2 in. x 5 ft. 0 in..... 2 sets
For windows, triplet, ea. 2 ft. 6 in. x 3 ft. 2 in..... 2 sets
For windows, single, 2 ft. 6 in. x 3 ft. 2 in..... 2 sets
For windows, single, 3 ft. 0 in. x 4 ft. 6 in..... 5 sets
For windows, single, 2 ft. 8 in. x 4 ft. 6 in..... 2 sets
For windows, mull., ea. 2 ft. 0 in. x 3 ft. 6 in..... 1 set
For windows, single, 1 ft. 8 in. x 2 ft. 0 in..... 1 set
Base—
7/8 in. x 6 1/2 in. moulded..... 365 lin. ft.
7/8 in. x 4 in. plain (closets)..... 65 lin. ft.
2 in. base mould..... 365 lin. ft
1/2 in. quarter round floor moulding.. 440 lin. ft.
Picture moulding (7/8 in. x 2 1/4 in.).. 350 lin. ft.
Chair rail, 3 1/2 in. moulded..... 123 lin. ft.
Moulding to apply to plaster to form panels, 5/8 in. x 1 in..... 700 lin. ft.
Mantel for Living Room..... 1 unit
Shelf and Brackets for Living Porch mantel..... 1 unit
Interior doors—
(2 cross panel birch veneer)
Door, 2 ft. 6 in. x 6 ft. 10 in. x 1 1/2 in. 3
Door, 2 ft. 4 in. x 6 ft. 10 in. x 1 1/2 in. 1
Door, 2 ft. 4 in. x 6 ft. 8 in. x 1 1/2 in. 5
Door, 2 ft. 6 in. x 6 ft. 8 in. x 1 1/2 in. 5
Door, 2 ft. 2 in. x 6 ft. 8 in. x 1 1/2 in. 1
Clothes chute doors (whitewood).
1 ft. 0 in. x 1 ft. 8 in. with jambs and trim..... 2
Slide, 1 ft. 0 in. x 1 ft. 8 in. x 1 1/8 in..... 1
Solid fir cellar doors.
Door, 2 ft. 8 in. x 6 ft. 6 in. x 1 1/2 in. 1
Door, 2 ft. 6 in. x 6 ft. 6 in. x 1 1/2 in. 1
Scuttle to attic—
2 ft. 0 in. x 3 ft. 0 in. with trim, etc... 1
Closet shelving (7/8 in. x 12 in. pine)... 35 lin. ft.
Hook strip (7/8 in. x 4 in.)..... 25 lin. ft.
Rabbeted shelf cleat..... 20 lin. ft.
1 in. dia. pipe clothes rod..... 18 lin. ft.
Kitchen cupboard—
Front, 8 ft. 0 in. x 8 ft. 6 in., counter-shelf, drawers, doors, etc..... 1 unit
Main stairs. 1st to 2nd story, 15 risers. 3 ft. 0 in. wide, exposed bracketed string, semi-caged starting newel, balustrade at 2nd floor, etc..... 1 flight
Cellar stairs. 12 risers, box pattern, 2 ft. 8 in. wide, wall hand rail, etc. (yellow pine)..... 1 flight

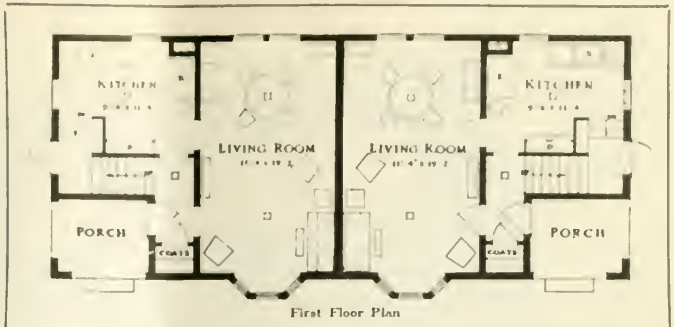
Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges.

Allow for general work not listed, etc., and include sub-bids.

Twin House Design

Convenient Layout of Five Room Home

MURPHY & DANA,
Architects



First Floor Plan





Second Floor Plan

PLENTY of room in a small space has been secured in this charming little twin house design.

The entrance porches are located at opposite ends of the buildings, so that the utmost privacy is obtained and extra room is obtained upstairs by utilizing the space over this porch.

Some may object to this as being too cold in the winter, but modern insulation materials can be had which eliminates this otherwise objectionable feature. The design of porch is such that it may be very easily glass enclosed.



Artistic School Design

Convenient and Practical Layout of a Modern School

SCHERMERHORN & PHILLIPS, Architects

BUILDING statistics reveal the great demand for schools and the erection of many more are in contemplation, therefore, it will interest our readers to carefully examine the design and details of the school shown herewith.

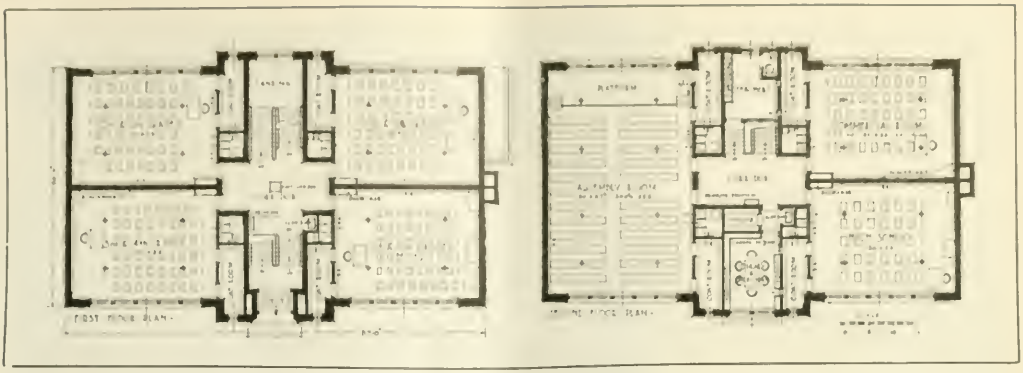
This school was erected at Plymouth Meeting, Montgomery County, Pa. It is called the Plymouth Township and Consolidated School, and Alexander Chambley of Philadelphia was the general contractor. As will be observed by an examination of the plans shown on the next page, the building contains eight classrooms, two of which are used as an assembly room when the folding doors are opened. An interesting view of this assembly room looking towards the platform is given in another picture.

The corridor construction is of reinforced concrete and the stairs of steel with slate treads, the details of which are given later. The corridor floors are covered with battleship linoleum which tends to deaden the noise of walking and prevents disturbing the scholars.

Slop sinks are provided on each floor, as well as drinking fountains. The basement contains playrooms for



Interesting View of Assembly Room Looking Toward Platform



both boys and girls with separate entrances to each, and toilets connect with same.

On the second floor there is a good size teachers' room containing private toilet and a locker for each teacher.

Adequate coat closets have been provided in each classroom and extra space for supplies. Book cases have been supplied in most classrooms. Metal ceilings have been used throughout and the building is electrically illuminated by chandeliers as shown in the pictures.

The building is adequately heated by a fan furnace system located in the basement. This allows for proper ventilation at all times, no matter what the state of the weather may be.

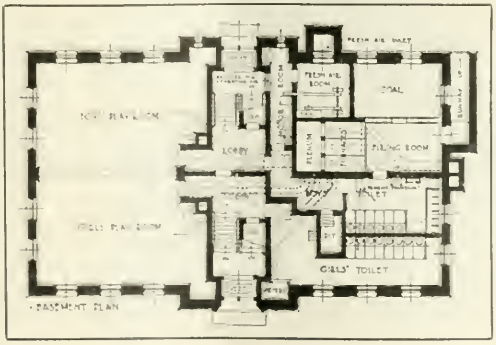
Blackboards are provided on at least two sides of the wall. The entire building has been designed with the idea that four room wings may be added to each end when required.

We give an interesting photograph of one of the stairways in this school. This is the stairway on the first floor rear and it shows the entrance door on the left hand side into the fifth and sixth grades school rooms and at the right of the picture the rear vestibule is shown.

As many readers will be interested in the construction of stairways which are such an important part of a school building—we give a detail of the construction of this stairway.

Halls and stairways in school buildings must be convenient to exits and of a size and construction that will properly safeguard the lives of the children within the building, as well as to provide ample accommodations for interchange of classes and other school purposes. The location and design are primarily peculiar to the individual building—the problem of construction, however, is somewhat similar in the same types of structures.

Tread in Inches	Riser in Inches	Angle of Stairway with Horizontal
12	6½	28° 27′
11¾	6⅝	29° 25′
11½	6¾	30° 25′
11¼	6⅞	31° 26′
11	7	32° 28′
10¾	7⅛	33° 32′
10½	7¼	34° 37′
10¼	7⅜	35° 44′
10	7½	36° 52′
9¾	7⅝	38° 02′
9½	7¾	39° 12′
9¼	7⅞	40° 25′
9	8	41° 38′
8¾	8⅛	42° 53′
8½	8¼	44° 09′
8¼	8⅜	45° 26′
8	8½	46° 44′



The stairs must be rigid and strong, built of noncombustible material whenever possible in order to minimize the danger of spreading fire and smoke.

The rise and tread should be such that going up and down is easy, considering that the majority of the people using these stairs are children, therefore risers should not be as high as for grown ups. The stairs should be a sufficient width so that excess crowding will be eliminated. Winders or steps on platforms should not be used. Most of the unfortunate accidents in school buildings have occurred on the stairs or hallways, therefore these should be of ample size with exits in at least two directions.

The illustration shows the arrangement of the stairs in this modern school. This stairway is constructed of steel strings with cast iron risers and slate treads. The treads used are of hard veined ribbon stock Pennsylvania slate as this has proven to fill all requirements of strength and resistance to wear.

Another point is that the non-absorptive qualities of slate are such that frequent washing of the stairs will

not in any way injuriously affect the material.

The detail drawing showing the construction of this stairway was prepared by Mr. D. Knickerbacker Boyd for the Structural Slate Association as a model for this type.

Where Building Code regulations do not specifically state the load to be provided for in calculating stairs, it is advisable to use 150 lbs. per sq. ft., as it has been developed that a densely packed crowd in a flat space weighs approximately that amount. While such a load could probably never be placed upon the stairs, there is a certain amount of vibration due to the movement of the load which makes this figure none too great for safety.

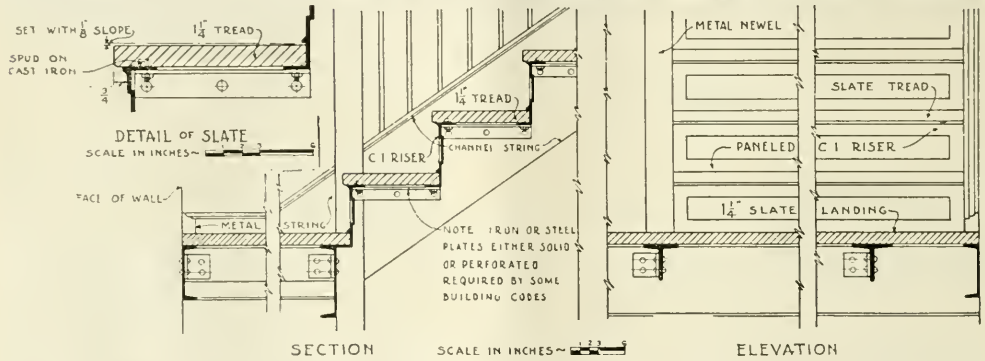
The arrangement of a stairway for ease in walking up and down depends upon the proportion of rise to the tread. Of the several rules applicable to proportioning stairs the best one is as follows:

The sum of twice the rise, plus the tread, should total from 20″ to 26″—thus a stairs with a rise of 7½″ and a tread of 10″ would total 25″ according to this rule. The table presented here will be useful for reference. It is recommended as good practice by the National Fire Protection Association.

The relation of tread to riser is a question of judgment; outside steps to a public building or to an interior monumental stairway should have wider tread and less rise than ordinarily would be the case. It means safety for the crowd, as the wide treads give ample standing room.



View of One of the Class Rooms



SLATE TREADS-CAST IRON RISERS-STEEL SUPPORTS

TYPICAL DETAIL OF A STAIRWAY SIMILAR TO ILLUSTRATION



The Stairways and Hall Are of Approved Construction

Practical Pointers *on* Selection *and* Use *of* Hot Air Furnaces *for* Residences

Some Principles of Hygienic Heating Discussed

By R. B. MONFORT

FOR the past ten years you have heard a great deal about bacilli, contagion, germs, infection and the need of sanitation. Also you have learned that scientists have made great progress in combating various diseases arising from different sources and that the advancement made along these lines has proven a great benefit to humanity.

Along with the many good things accomplished it would seem, however, that the old adage "An ounce of prevention is worth a pound of cure," should be the ultimate goal, thereby eliminating much unnecessary suffering.

Such a course might not prove practical for all ills, but a very large per cent. of the ailments classified under the head of "bad air diseases" are really preventable, and their elimination, to a very great extent, would lessen the mortality in the home. Death by disease is most miserable but the majority of us go that way.

Although winter is supposed to be the recuperating period, the so-called modern methods of living have apparently caused a reversal of nature's plan and these afflictions could rightfully be called "winter diseases." When we shut ourselves in the house with artificial heat, and no serious effort is made to exclude the fire-poisons or provide adequate ventilation, the membranous and nervous disorders become prevalent and often violent.

Real if Not Visible

Unfortunately very few of us pay any attention to the quality of the air in our homes when it is most essential to our very existence. Did you ever stop to think that you could live ten thousand times as long without food and fifteen hundred times as long without water as you can without air? If it is advisable to pay so much attention to the purity of our food and water, it behooves us to pay even greater attention to the purity of the air which we breathe.

Nature performs wonders if her ways are not interfered with too seriously and this article is written with a hope that in some measure we can contribute to better hygienic conditions in the home, during the winter months, more than one-half the year, by showing how to preserve nature's vitalizer—pure air.

Is the Mission to Serve or Destroy?

ONE of the most dangerous sources of contamination from the heating plant is the escape of the products of combustion through the fire-box into the air circulation. Of these you must realize that carbon-monoxide, an insidious gas, is the most dangerous because its presence in the atmosphere even in minutest quantities, acts as a slow poison destroying the "haemoglobin" or half-mature cells in the process of formation. This breaking down of the cells is responsible for many serious nervous disorders, kidney and heart afflictions, and their accompanying disastrous effects.

Should you save the newspaper clippings you would be astounded by the number of families that are entirely wiped out by carbon monoxide poisoning, which only emphasizes that it is the most deadly gas known.

Irregular temperatures are not conducive to good health nor do they add to the comfort of the occupants of the building. They seriously interfere with the natural thermostatic action of our bodies, which is nature's method of protecting us against too sudden changes, consequently play their part in causing colds.

Super-heated air has the same depressing effect as stagnant air, both having the vitalizing principles or energizing properties destroyed. Very few people are able to distinguish between "scorched" or "stale" air and both are recognized as "stuffy" or "dead." Chemical analysis seems to reveal no difference. They both have a decided depressing effect upon our physical stamina.

It is easy to understand why but few people realize to what degree the air in a building becomes contaminated by the occupants, because they have never studied this subject.

The exhalation of carbon dioxide from the lungs, the evaporation from the body, saturate the atmosphere with foul moisture which by lessening our powers of resistance increases our susceptibility to disease. To show that this point is worthy of consideration, the actual secretion of H_2O from the eye, nose and mouth of the average adult in one hour is eight ounces or one common glass full. Add to this the effluvia from our bodies, consider the total pollution and you will realize why many homes are "culture medium" for the multiplication of germ life. These facts are called to your notice to impress upon you what the atmosphere in most houses lacks that is essential, and what it contains that is detrimental to your welfare.

Cleanliness for Self Protection

TO enjoy the measure of satisfaction, happiness and health, that one should rightfully expect, extra precaution must be taken to prevent the contamination of the air by the heater itself; to prevent the destruction of the energizing properties of the air by overheating and to promptly remove any contamination to the atmosphere by the occupants of the building. In other words build your homes a safe refuge for your customers during the winter, by having the atmosphere as fresh and invigorating as it would be outdoors.

To obtain a heating equipment that will insure necessary hygienic benefits it will naturally require some outlay of money and in order to come within the means of a large per cent. of the intending home owners you will naturally recommend the warm air gravity system. Steam or hot water heating plants combined with a ventilating system are satisfactory in large buildings. In small cottages, however, the cost generally prevents their use.

The Fire-Box the Critical Element

Steel, which is impervious to penetrating gases, answers admirably for the construction of the fire-box, the different parts should be securely welded, eliminating all rivets and seams so that it is made imperforate, or into one continuous piece of metal. All top surfaces should be eliminated and the radiating surface should be free from all irregularities with ample space between heater and casing to permit an uninterrupted air supply of large volume.

Avoid Scorched Air

THAT the air may be only mildly heated, never above 150 degrees F. at point of contact with the furnace, large capacities must be specified in both heater and warm air pipes, and a positive automatic control should be utilized, of which the fire-box proper is the principal and actuating member. This not only prevents overheating that devitalizes the air but is a great personal relief from many of the anxieties and uncertainties that seem to be a part of the ordinary heating plant. Not only uniform temperature with but slight attention to the equipment is secured, but it is a protection to the heater and a protection to the home which gives a great sense of security from unexpected disaster.

Advantages of Rapid Internal Air Movement

The ventilation and heating are so interdependent that they must be embodied in the same system. On this point you must not compromise the health, vitality or personal development of the household.

The air should be completely changed in each room every ten or fifteen minutes and the analysis should be such that at no time will it test more than six parts of carbon dioxide to ten thousand parts of air, which comes within the prescribed limits of the health authorities. To make this possible it is essential that the return capacity to the furnace equal the capacity of all warm air ducts and in addition an outside air pipe be provided of sufficient size to supply twenty-five hundred cubic feet of air per hour, per person, figuring twice as many persons in bed rooms as the average occupancy.

The returns must be scientifically distributed so as to positively prevent annoying and dangerous drafts upon the floor. If the home has an open stairway, a large return face should be located near the bottom to prevent the cooler air from upstairs spreading over the first floor, and the other return faces should be so distributed throughout the living rooms to avoid any disagreeable drafts, even to small children playing upon the floor. The ordinary fire place is usually sufficient for vent purposes.

In addition to the advantages outlined you are assured of a rapid internal circulation that trebles the movement of the air; positive distribution which makes the heating of windward rooms feasible; the avoidance of great differences in temperature between floor and ceiling and the prompt removal of the vitiated air.

Economy Essential

ITEMS in furnace construction that spell *Economy* in big letters are as follows: Design of fire-box eliminating irregularities with maximum radiations; complete down draft principle; large fuel space with large grate area in proportion, insuring slow combustion and automatic regulation preventing wasteful fires and disastrous over-heats.

Two other things are such important factors that they deserve special mention, not because they come within the province of the building contractor, but because they mean such a saving to the home owner: The depth of the basement, which should be eight feet in the clear if drainage will permit, and the air tight construction of a furnace flue of proper capacity. The greater the depth of the cellar the more elevation to the warm air pipes, consequently the more positive the distribution of heat. Helping to reduce fuel consumption to the minimum with no valuable head room utilized are other valuable features insured. A long article could be written on flue construction but we will pass the subject by saying a leaky chimney often increases fuel consumption over 100 per cent. and decreases heating efficiency over 50 per cent.

Harmony Important for Ideal Results

The heating plant should have right of way over plumbing and electric wiring because the two latter can easily avoid obstruction and not interfere seriously with their efficiency.

The building contractor can assist in many ways by extending his cooperation in the practical location and installation of heating equipment. This means greater heating efficiency at less cost which gives a greater sense of satisfaction to the home owner, consequently works to the advantage of all concerned.

By planning the heating layout with the building, with the view of obtaining maximum results, the builder will render invaluable service to his client.

The selection of the proper heating apparatus combined with the harmony of forces as suggested will render a great service to humanity and enable many a progressive man to realize his life's ambition of a nice home, which provides comfort, health and happiness for his family. Nature's restorer, pure air, should prove his greatest blessing.

The Chimney

FEW owners of heating plants realize that the chimney is a vital factor in securing the proper combustion of fuel and the satisfactory distribution of heat. The chimney creates the draft for any kind of heating apparatus. The furnace, in itself, has no appreciable draft—a fact not recognized when the furnace smokes and the house is cold. Far too much worry, inconvenience, and ill-feeling have resulted from a lack of knowledge about chimneys on the part of many house owners and some chimney contractors. If the furnace smokes, if the fuel does not burn properly, if the temperature does not register the degree specified in the contract, the heating system, too often, is condemned. Then follow complaints, discussions, tests, loss of time and loss of money. The conclusion of the whole matter, in a very large percentage of cases, is a poorly constructed flue.

The primary function of a flue is to provide a suitable conduit for the escape of the smoke and gases thrown off by the process of combustion. A necessary physical condition is a small area wherein a uniformly higher temperature can be maintained than that of the outside temperature. The essential object must not be overlooked in chimney building.

From Corner Grocery *to* Small Office Building

CLARENCE E. WUNDER,
Architect

ON a recent visit to Philadelphia, the editor of Building Age and The Builders' Journal had the pleasure of seeing a very cleverly handled alteration job. It was to quite an old brick building located at 254 South 15th Street, which was used as a grocery store with apartments above.

This section of Philadelphia is changing quite rapidly to a business district, therefore the owners of this building decided to change it and called on Mr. Wunder to undertake the job.

Old Colonial traditions, with which Philadelphia abounds, have been carefully carried out in this remodeling job. The two pictures speak for themselves and a glance at the lower picture, which was taken when the alteration work commenced, makes one wonder what could be done with such a building.





The Old Building Had But Little in Design to Commend It

A cornice of galvanized iron was run around at the roof line and a parapet wall carried above this, thus giving a finish to remodeled structure that was entirely lacking in the old building, which looked like it had been chopped off.

The old stoop and store front were removed and the brick work and windows substituted. This is about all that was done to the exterior structural work, except repainting the old brick work. Of course, the entire interior was ripped out and divided into offices. A fire escape of the improved tower form was provided at the rear end of the building.

It may truly be said that a wonder has been made by Wunder in the alteration of this building.

Modern Automobile Service Station

Interesting Building Erected at Springfield, Mass.



REPAIRING automobiles has developed into a large business, not far removed in importance from that of manufacturing them. All the big auto manufacturers pay particular attention to service stations where different repair parts are kept and repairs actually made.

A rather interesting building for this purpose is illustrated herewith. This was recently erected for the Packard Motor Car Company and Samuel N. Green Company of Springfield were the engineers and builders. Our picture shows the completed structure and on the opposite page are the plans of the two floors which show the layout of the principal departments. The building has a frontage of 70 feet and a depth of 209 feet 9 inches.

As the picture reveals, the front is of pressed brick with art stone bases and trim. Large plate glass show windows enable the passerby to see the cars on display. The structural part of the building is of reinforced concrete with brick inserts from the floor level to the window sills which are made of concrete.

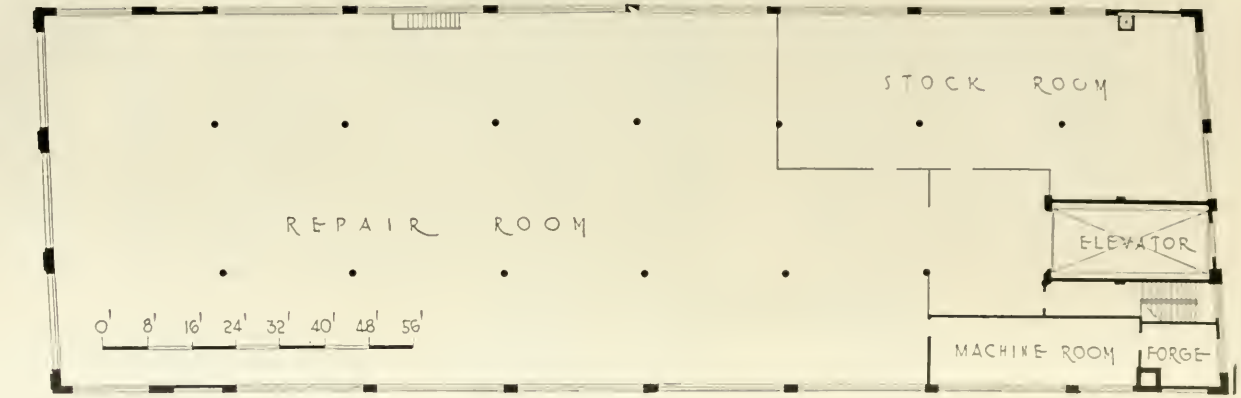
Steel sash has been used throughout. The exterior walls consist of practically only piers so that the maximum amount of light is obtained for the interior. The interior of the building is supported by reinforced concrete piers 18 inches in diameter, set on footings 2 feet deep by 6 feet wide. These piers are spaced about 25 feet on center. The first floor is of concrete 6 inches thick, laid directly on the earth. No cellar has been provided as it was not necessary in this type of building.

The second floor is of reinforced concrete 10 inches in thickness, but there is some slight variation over certain areas. The columns supporting the roof are of reinforced concrete 14 inches in diameter and the roof itself is composed of a thickness of 8 inch reinforced cinder concrete and to make a practically water tight job, four-ply tar and gravel was placed on the top. The roof was given a pitch of one-half inch to a foot crosswise and one-quarter inch to the foot lengthwise. The roof drained to downspouts in 4 inch cast iron drains inserted in some of the concrete columns.

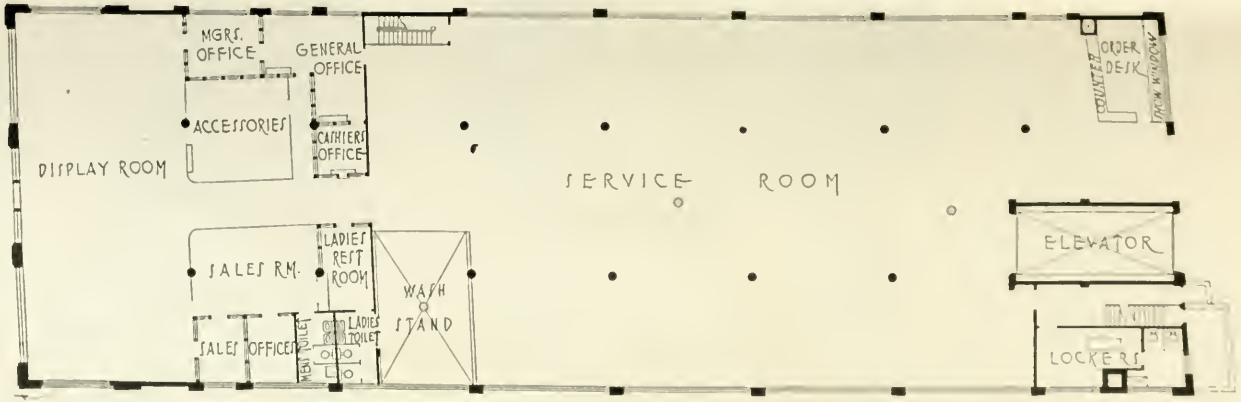
As is well known to every student of the strength of materials, the central portion of a column adds nothing to its strength, and this is why hollow columns are used to such an extent. In concrete construction columns are usually solid owing to the expense of inner-molds. However, the use of pipes for drains, etc., takes care of them, keeping them out of the way of other parts of the structure and at the same time does not affect the strength of the structure.

The second floor is given over to a repair shop. The machine room and forge shop are separated by plastered partitions.

As an interesting example of a modern commercial building, the owners and builders can be complimented on the artistic and practical handling of the entire operation.



Second Floor Plan



First Floor Plan

Floor Arrangement of Packard Service Station Described on Opposite Page

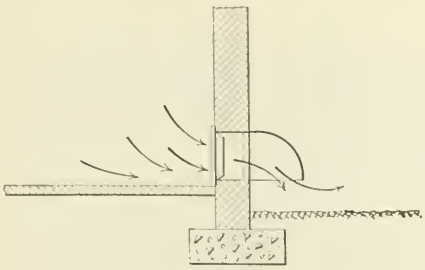


Fig. 1

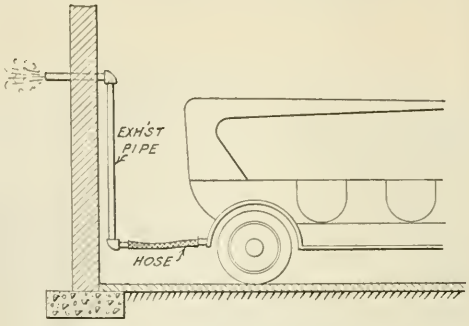


Fig. 2

The Importance of Ventilating a Garage To Eliminate Poisonous Gases

By CHARLES L. HUBBARD, M. E.

VERY little, if any, attention is paid to the ventilation of the average garage, while, as a matter of fact, no building in common use requires greater precaution in this regard.

The reason for this is the presence in varying quantities of two invisible gases, one violently explosive and the other a deadly poison. The first of these comes from spilled or leaking gasoline, and this being a volatile liquid, at once forms a gas, which, when mixed with air in the right proportion forms an exceedingly explosive mixture, the same as is produced in the cylinder of an oil or gasoline engine. This fact has an important bearing upon the heating and lighting systems, as it prohibits the presence of any fire or exposed flame in spaces exposed to this mixture.

The other gas is known as carbonic oxide or carbon monoxide, and appears in the exhaust from a gasoline engine when the carburetor is not properly adjusted or when, for any reason, there is not sufficient air supply for complete combustion. It is the same gas that is given off from coal stoves under certain conditions and causes asphyxiation. It is both invisible and odorless, and therefore difficult to detect. When present in sufficiently large quantities it kills quickly, while in smaller quantities it acts more slowly and gradually undermines the health of persons breathing it more or less continuously.

The danger comes from running motors for test or other purposes in closed rooms without special provision for ventilation, or from breathing the exhaust fumes when working under a car in which the motor is running. There have been a number of deaths from this cause in small private garages where the doors have been closed on account of cold weather. In larger buildings, where there is more space, the harmful results are likely to be more gradual unless the workman breathes the fumes directly as they are exhausted from the motor, as already noted.

Having noted the conditions brought about by the presence of these two gases let us see what practical means may be employed for their removal.

Taking up the gasoline vapor first, the simple arrangement shown in Fig. 1 often proves all that is necessary in case of a small garage, and these openings may be multiplied in buildings of larger size. The scheme illustrated in Fig. 1, consists of a wall opening at the floor level, provided with a register for closing when not in use, and an outside hood for preventing the wind from blowing directly into it.

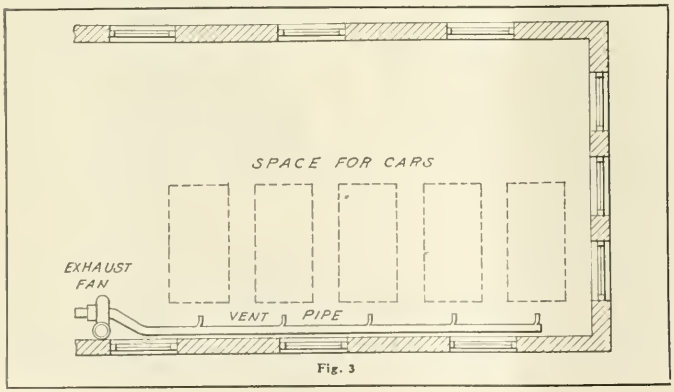


Fig. 3

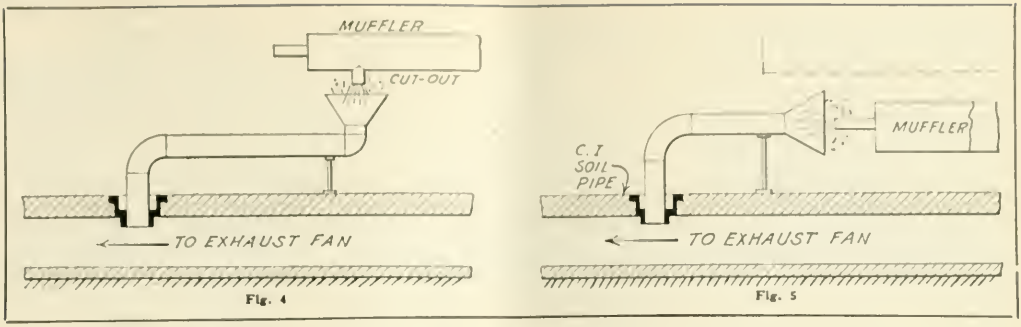


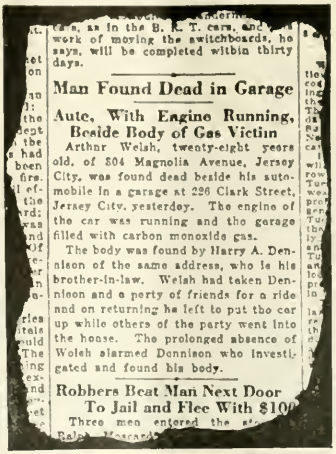
Fig. 4 Fig. 5

As this vapor is heavier than air, it falls to the floor and will flow out of an opening of this kind like water, unless opposed by too strong a wind pressure. When the weather is warm enough, open doors provide the best means for disposing of this gas. A community garage like picture below is safe with doors open but when closed should have ventilation.

One of the simplest and newest effective ways of removing the exhaust gases from a small garage is shown in Fig. 2, and requires but little description. An iron exhaust pipe is carried out of doors, and provided with a flexible rubber hose, the free end of which is furnished with a special nozzle which fits closely over the exhaust outlet from the muffler, thus preventing any of the poisonous or irritating gases from entering the room.

If it becomes necessary to start up the motor for testing or adjustment with the doors closed, the hose should always be slipped over the end of the exhaust pipe and it is a good precaution to do this anyway if the rear of the car is away from the door and a person is exposed directly to the exhaust gases. An adaptation of this same scheme to a larger building is shown in Fig. 3, in which a horizontal vent pipe is carried along the wall at the rear of the space provided for cars, having outlets at different points to which a hose connection may be made with a motor exhaust, in the same manner as already shown in the illustration Fig. 2.

These openings should be capped and enter the main vent pipe on an angle toward the outlet. By attaching an exhaust fan to the end of the main pipe, as shown in Fig. 3, and leaving the hose connections open, a certain amount of general room ventilation may be obtained which will care for much of the gasoline vapor also, if the openings are close to the floor. Another similar arrangement, especially adapted to trucks, where the exhaust may be either through the muffler or cut-out, is shown in Figs. 4 and 5.



work of moving the switchboards, he says, will be completed within thirty days.

Man Found Dead in Garage

Auto, With Engine Running, Beside Body of Gas Victim

Arthur Welsh, twenty-eight years old, of 804 Magnolia Avenue, Jersey City, was found dead beside his automobile in a garage at 226 Clark Street, Jersey City, yesterday. The engine of the car was running and the garage filled with carbon monoxide gas.

The body was found by Harry A. Dennison of the same address, who is his brother-in-law. Welsh had taken Dennison and a party of friends for a ride and on returning he left to put the car up while others of the party went into the house. The prolonged absence of Welsh alarmed Dennison who investigated and found his body.

Robbers Beat Man Next Door To Jail and Flee With $100

Three men entered the ...

The opening into the under-floor duct is through the bell of a castiron soil pipe, and when this is not in use it should be covered with an iron cap the top of which is flush with the floor, the same being provided with a finger hole for convenience in lifting and also to furnish a continuous draft opening into the vent duct to draw off any heavy gases which may collect at the floor level. A considerable number of these openings should be provided according to the size of the building.

To impress the importance of ventilating a garage on our readers we give here a newspaper clipping of a recent fatal accident. Had any of the precautions that we point out in this article been provided a life would have been saved. When building a garage builders will be doing their customers a real service by calling their attention to this matter. It is as important as providing fire exits in theatres, etc.



Type of Community Garage That Should Be Provided with Adequate Ventilation

Hog House *of* Unusual Design

HEACOCK and HOKANSON, Architects

ONE requisite of the modern hog house is to have plenty of sunlight, together with adequate artificial heating for cold weather, and plenty of ventilation at all times.

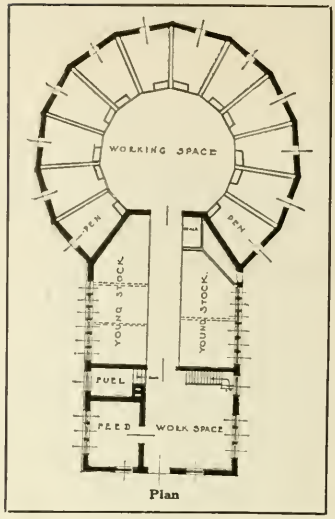
Improved hog houses have helped to eliminate disease and put the stock-raising business on a better paying basis than ever before. It is now a well recognized fact that hogs, especially expensive prize stock, require careful attention in the winter as well as other live stock; their better treatment results in better prices.

The pictures and plan shown herewith illustrate a modern piggery erected for Mr. Joseph R. Grundy at Croyden, Pa. This unique building was erected by Mr. Yardley Stradling, building contractor of Oxford Valley, Pa., from plans prepared by Messrs. Heacock & Hokanson, architects, of Philadelphia, Pa.

These buildings were built of hollow tile covered with Portland cement stucco. Perhaps the most interesting feature is the circular end; it is really a fourteen-sided figure.

A concrete floor was laid in this hog house, having a removable plank floor in each pen. Everything has been installed with the idea of keeping sanitation foremost so that the valuable prize stock is well taken care of.

The pens are divided by solid partitions and the interior division rail is of wire mesh, supported on pipe frames.



Plan



View of Modern Hog House



The Circular Sunlight End



Interior View of Circular End

Windows in the roof directly over each pen allow an abundance of sunshine, and a radiator over every other pen furnishes an abundance of heat in the coldest of weather. The top monitor windows afford plenty of light and ventilation while preventing cold drafts on the stock.

Each pen is provided with an outside door so that the pigs can have the advantage of the run. The fencing for these runs was not installed at the time our photograph was taken.

Observe the frame work supporting the litter carrier; this provides for easy cleaning and bedding. This is a piece of equipment that is really a necessity on the modern farm where time counts. Building contractors should be familiar with the different forms of equipment and the proper methods of installing same.

MASONRY
Practical Information on Materials and Latest Construction Methods



Spoiling *the* Beauty *of* Brick Work

Unfortunate Practice Reduces the Value of Buildings

By GEORGE W. REPP

WHAT dreams of artists, architects, engineers and town planners have passed before us in the last decade in endless procession! And the fruitage of these plans, evidenced by actual improvements in most every community, bear witness to the progressive spirit of our people.

Cities and villages throughout the country "point with pride" to their parks, boulevards, monuments, public buildings and utilities, and to their plans for the future. Civic bodies, commercial clubs, art commissions, real estate boards and other organizations composed of progressive citizens, are constantly devoting their time and efforts to the furtherance of the City Beautiful.

But while all these plans concern the community as a whole and should influence each individual in making his own improvements, be it commercial or home building, it is to be regretted that quite often the individual gives little thought to the part his construction plays in the building of a City Beautiful. The citizens can not always point to their own property with the same pride they may justly take in their city and its accomplishments.

Frequently home owners fail to think of the importance of well designed exteriors to their homes. Or even if they use a fairly acceptable design, they too often commit the grave fault of making the front pretty while neglecting the sides and rear. They are glad enough to have an attractive street, but seem oblivious to the ugliness as viewed from the garden on the side or rear. They are very much like the man who thinks himself well dressed with a dickey shirt front.

Many a real estate operator or contractor in our cities also commits this fault. Building homes for speculation, either for the sake of lowering the sale price or for the larger profits possible, he forgets his obligation to the larger community by skimping on the materials and design of the house, except of course the front. He knows there must be some attractiveness about the house, to make a selling appeal, and so he puts it



Fig. 1—Face Brick Used for All Four Sides of This Bungalow—Beauty at Small Cost



Fig. 2—Poor Appearance Obtained by the Mistaken Notion of Saving a Little Money

on the front where it first catches the eye. He fails to see the short-sighted absurdity of such a course, and resembles the small boy, who reluctantly washes his face, leaving his neck and ears dirty. The boy, under protest, cleans as little of his anatomy as possible, and the builder reduces the attractive area of the house exterior to the minimum. He, so to speak, washes the face of the house for the sake of appearances but fails to clean its neck and ears.

Unfortunately, however, such houses sell because the public find no better ones; and the builder, mistaking this for approval of his operations, continues the pernicious practice and thus sets a bad example for others who fear that if they build better than their competitors, the advanced costs will prevent ready or profitable sale. They have not recognized the fact that there is an inherent love of beauty in everybody, so that the public are constantly demanding not only better buildings, but more beautiful ones as well.

To take a specific example. In some communities there are whole sub-divisions built up of poorly designed homes, with face brick fronts and common brick sides and rear, that resemble the walls of cheap factory buildings in vogue years ago. Whether built on wide or narrow lots, the sides of these houses are, more or less, visible from the street, making a discordant note, and giving the effect of pretty masks on ugly faces.

It is hard to estimate how much it would mean to the occupants, and the whole neighborhood, if the builder had carried the face brick around the entire sides and rear, when fully exposed, or returned it on the sides, at least a suitable distance, when partially exposed, so that none of the discordant common brick sides would be visible. Beautiful things have a vague but effective influence for good on the lives of everyone wherever they are introduced.

Every builder or owner of a house should feel obligated to help in making his own town as beautiful as possible. He thus not only gives himself satisfaction but enhances the value of his neighborhood and raises the general tone of the whole community.

A comparison of the bungalow in Figs. 1 and 2 will strikingly illustrate this point. In Fig. 1 the walls of the house all around are of face brick, while in Fig. 2, where the house is almost identical in design, the owner or builder decided to save a little by using common brick on the sides. The pictures speak for themselves.

The cheap and incongruous effect is at once obvious. Nothing need further to be said except that these houses were built in a section of a city where the lots are wide and where no possible excuse existed for such treatment of the exterior. Of course, the excuse is cost, but this is only specious.

Let us see, approximately, what the added expenditure would be to carry face brick around the building. Assume that the side-wall is 40 feet long and 12 feet high, giving an area of 480 square feet, from which 10 per cent., or say 50 square feet, should be deducted for openings, leaving 430 square feet to be faced with brick. At 7 brick per square foot, this would amount, in round numbers, to 3,000 brick. With face brick such as used in the building shown at $34 per M., and common brick at $18, the difference of $16 per M. would mean $48 extra to supply the face brick for one side. Counting the rear at about half the area of the side, the added material cost for the two sides and rear of face brick would be $120, to which is usually added an extra labor charge for laying the face brick, but should not be great, as the common brick laid in the face of a



Fig. 3—Face Brick on Part of Side a Step Far in Right Direction But Not Far Enough



Fig. 4—A Little More Face Brick Used on Side of Apartment House Would Have Added to Its Beauty

wall must be laid with care. A few steel lintels for level heads to the windows and cleaning down the walls would increase this amount approximately to a figure between $150 and $175. A small sum indeed compared with the total cost of the building.



Fig. 5—Two Garages That Speak for Themselves

Yet the builder proceeds along the old conventional lines which he believes fixed, afraid to strike out and build better. Let him try it out, however, and see how the public will respond, rather than wait until they demand it. Certain improvements have been made along this line, but they have failed because of a lack of artistic sense on the part of those responsible for the design.

We see examples where the material of the front has been carried around on the sides a certain distance and stopped when it was thought that it had gone far enough, without considering where the junction between the face and common brick would fall in relation to the design. Frequently the face brick is stopped at the edge of a window or at the middle of a pier between two windows instead of at some natural break in the surface of the building, such as a chimney projection, a bay, or an angle in the wall.

In Fig. 3 the face brick was stopped at such a natural break in the wall. This is a step in the right direction and should be encouraged. When exposed, this division between face and common brick on the side is an architectural monstrosity, but of course it is presumed that another such building will be built alongside, hiding the common brick from the street except from a point directly between the two buildings, where it will always remain as an eyesore to those who daily enter the building. Perhaps, some day, we will not be content with this and will demand that the view from the court windows be upon beautiful walls.

An example of the common treatment of the side walls of an apartment building is shown in Fig. 4. The face brick in the building on the left, it is painfully evident, returns only a few inches, thus exposing the common brick to view alongside of a very attractive face brick building. Had the face brick been carried back ten feet, at least, it is doubtful whether the increase in cost would have been much over fifty dollars, and it is certain the street appearance of the building would have been greatly improved.

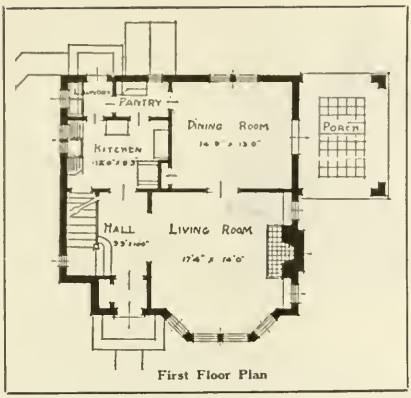
Note, for example, in Fig. 3, the pleasing effect of the face brick side of the adjoining building. As the cost of improving the side walls is so small an item, there seems no excuse for the ugly exposed wall. If the public would awaken to the fact that the City Beautiful depends a great deal on their individual effort, this abuse could be done away with.

Because of its insignificance, perhaps, the garage is another example where design and material are too often forgotten. We see the atrocious frame or corrugated iron garage behind a beautiful brick residence. And when they are built of brick, the sides and rear are too often of common brick with the inevitable false face brick front. Does not the garage which is seen from all the surrounding buildings deserve to be in character also? Notice the difference in the two garages shown in Fig. 5. The one in the foreground is well designed, and built all around of the same material, while the one beyond is not only a poor design but, with its incongruous face and common brick, detracts from the appearance of the street.

It would better be of common brick all around, if money must be saved, rather than to have face and sides of different kinds of brick. The sum of the whole matter is, the attractiveness of many buildings, and in consequence, the artistic values of a community, are greatly reduced from an entirely mistaken sense of economy. The consistent treatment of a building in design and use of materials, might involve a little added initial cost, but would invariably advance the economic worth of the structure both for the owner and his neighbor besides the passerby.



Fig. 6—No Cheap Construction Here but a Lack of Taste—Face Brick on All Sides and Stucco in Gable Would Improve Appearance



First Floor Plan



Picturesque Hollow Tile House

WALLACE & WARNER, Architects

SET on the terrace, this house presents a dignified appearance from road. The various details of its exterior suggest the Dutch Colonial, which is rather appropriate, as this house is located at Narbeth, Pa., in the section which gave us our Dutch Colonial style of architecture. This house was erected under the architect's direction by E. J. Hedden, building contractor, of Philadelphia.

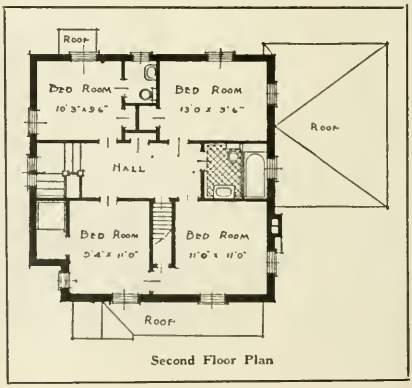
The architects have succeeded in embodying a pleasing exterior to what is practically a square box. The little break at the left-hand side of the building removes the monotony of the absolute square, while the porch on the opposite side gives distinctiveness to the right side. The large bay window in the living room forms a pleasing feature of the front. The hood over the doorway is carried out in true Dutch Colonial style, and joining this is the hood over the bay window.

The construction of this house is of stucco-covered hollow tile set on a local stone foundation, the joints of which were pointed up in white mortar, this contrasting very nicely with the green of the lawn and the stucco above it.

The rooms have been very conveniently laid out. They are of good size and particular pains have been taken to have them so placed that communication between all is easy. One enters a vestibule in which one side is taken up by a coat closet. The reception hall has rather an artistically laid out staircase, sufficient headroom for which has been carefullv allowed by having a slope in the bedroom closet above. The two platforms, besides making a pleasing appearance, also make ascent easy.

A door leads directly from the hall to the kitchen and the cellar is reached by stairway underneath the main stair from the kitchen. The sink is placed directly under a mullion window, which gives ample light. Entrance from the dining room to the kitchen is had by means of the pantry. As some folks desire the washtubs upstairs, the laundry has been made into what would be a rear entry; serving the purpose of both.





Second Floor Plan



BUSINESS GETTING METHODS

Ideas that have worked for others

An Example *of* Co-operative Advertising

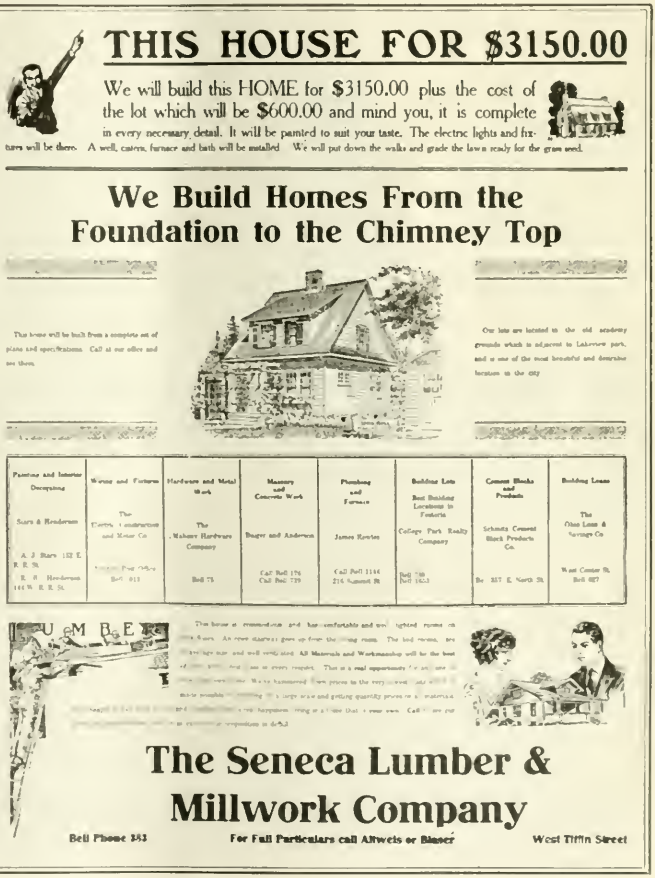
How an Enterprising Lumber Concern and Different Contractors Combined to Secure More House Business

FROM time to time the question arises with the progressive building contractor how he can best advertise so as to secure some desirable contracts for building homes at a reasonable expense.

He feels, and it is certainly true, that if he secures a customer other people will get a large share of the money involved and they do nothing towards creating the order.

As has been discussed in previous issues of BUILDING AGE, and The Builders' Journal, co-operative advertising is what is needed. Usually, every progressive builder has one favorite firm from whom he purchases his lumber and likewise he also has different favorite sub-contractors, men on whom he has learned to depend by years of experience. Now, all would profit by new building jobs and one way to get them is by advertising.

A move in the right direction along these lines has just been started by Mr. B. M. Altweis, the general manager of the Seneca Lumber and Millwork Co. of Fostoria, Ohio. They have taken the lead in that city by advertising in full page space in their local paper. We give opposite, a small size reproduction of one of their advertisements. Note particularly that the different contractors each have taken part of the space. If the same idea was carried out in different localities, it would certainly result in more and better business for all concerned.





CONTRACTING EQUIPMENT

Reliable Information on Time and Labor Saving Devices

Proper Scaffolding

A Few Points to be Considered for Safety and Economy

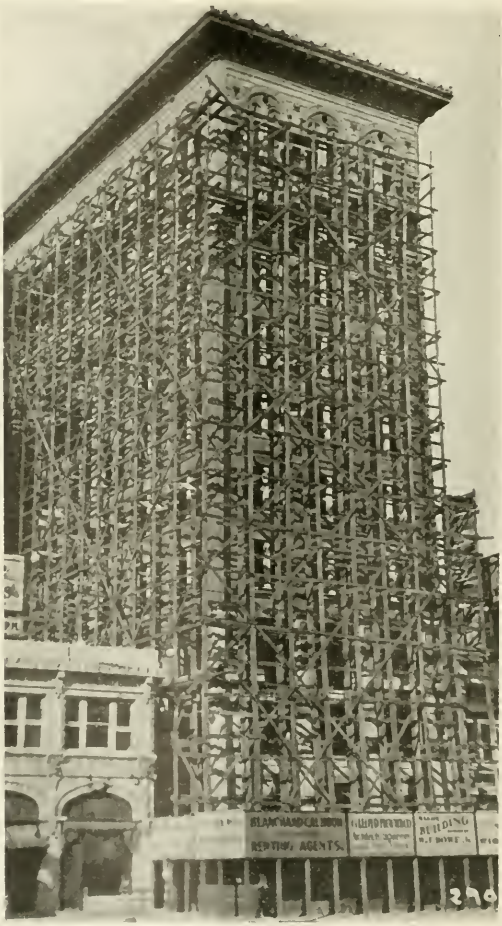
CONSTRUCTING proper scaffolding is not only a humane provision, but a good business investment as well for the contractor. When workmen are able to work with an assurance of safety they are able to do better work.

It is a curious fact that there are a larger number of accidents (in proportion to the men employed) on smaller jobs than on large construction projects.

In this article we show a few examples of scaffolding work. One is a small cottage. Here just a few planks and uprights have been carelessly "tacked" up, and it is on such unsafe systems of scaffolding that the majority of accidents occur.

Our other two illustrations show two large buildings in which particular attention has been paid to proper and safe scaffolding. A careful inspection of each picture will reveal the care that has been taken for safety.

The first illustration shows the scaffolding erected around a building on Broad Street in Augusta, Ga. This scaffolding was erected around this building for repairs to the exterior, the entire interior having been gutted by a recent fire. Notice particularly how the braces have been run so there will be no swaying. The sidewalk has been covered by a shed. The other illustration is that of a building under construction at 57th Street and Madison Avenue, New York City, the contractors on the job being Cauldwell & Wingate.



Scaffolding Erected for an Augusta, Ga., Skyscraper

Observe how carefully sidewalk shed has been erected. This job is for a building about 200 x 100 feet in size and shows the application of scaffolding work on a large low job, while the previous illustration showed that for a high job. Safety in both were secured.

It is interesting to note that in the Cauldwell & Wingate job use was made of an improved timber clamp, which enables the erection of scaffolding to be done in less time, without the cutting of any timber. It is surprising to note the holding power which these timber clamps have.

In a recent test, two pieces of 4 by 4 scaffolding uprights were spliced with two of these clamps and they held a weight of 9,120 pounds before the timber cracked.

Note particularly in this job that the uprights extend above the working platform and a guard rail is placed around. Also a toe board has been made use of. This serves a twofold purpose, protecting the workmen and preventing any material being shoved off the platform.

A move in the right direction is being made by the Department of Labor and Industry of Pennsylvania. They have just prepared some rules on the proper erection of scaffolding, and below we give a few extracts from these regulations, for they are of considerable interest:

The erection, alteration and removal of scaffolds shall be done under the direction and supervision of men thoroughly experienced in scaffold work.

Lumber used in the construction and erection of scaffolds shall be of long leaf Yellow Pine or the equivalent thereof in strength (Hemlock prohibited), and shall be sound, well seasoned and free from strength reducing defects.

Planks used for flooring shall be of uniform thickness, so as not to cause unevenness, and in laying same care shall be taken that "traps" are avoided.



Poor Type of Scaffolding

Guard rails and toe boards shall be provided on the outer edges and ends of the platforms of all types of scaffolds ten feet or more above the ground (including rails across window openings which extend more than thirty-four inches above the scaffold platform), except riveters' outrigger scaffolds, and shall be securely fastened to the uprights on the platform side.

Guard rails shall be the equivalent in strength of wood rails one and three-fourths by three and three-fourths inches, dressed, and shall be not less than thirty-four inches in height. They shall be secured to uprights at intervals of not more than eight feet.

Toeboards shall project not less than six inches above the top of the platform planks and shall be erected so as to leave no space between the platform planks and the toeboards. (For safety of men below and on platform.)

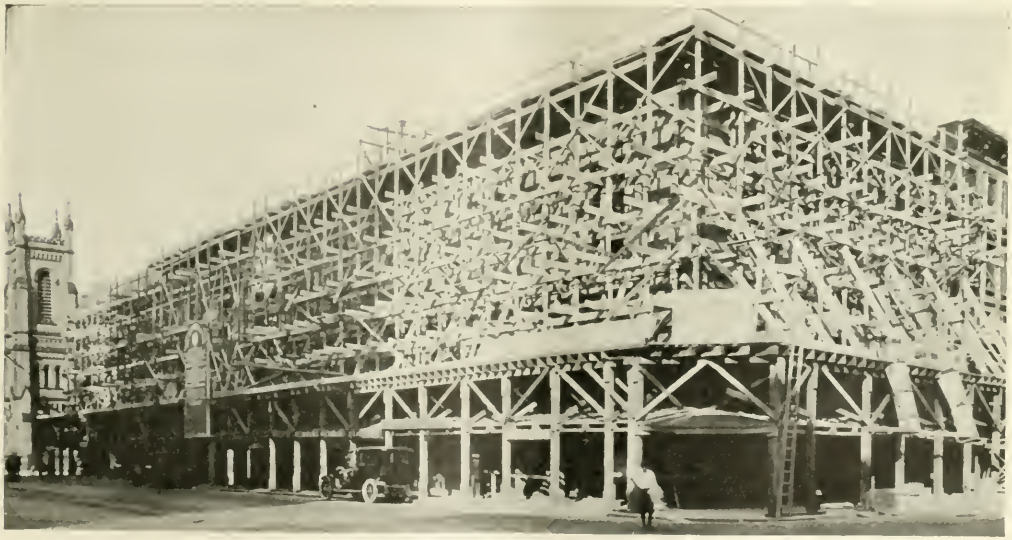
Nails of proper size (minimum—10 penny), of ample length and of the best quality shall be used at all times. They shall be driven full length, especially in braces, and the bending over of partly driven nails is absolutely prohibited.

Where it is necessary for workmen to crawl out on thrustouts or projecting beams, life lines and safety belts of approved design shall be worn.

The principal members of scaffolds shall be rigidly and securely sway braced to prevent their displacement in any direction.

For carpenters' bracket scaffolds, the platform boards shall be laid tightly together and shall overlap the brackets by at least four inches, but not more than six inches. The boards shall be heavy enough to prevent springiness.

Brackets shall be spaced at intervals of not greater than four feet. There shall be at least three brackets underneath each board.



Safety First on This Large Job of Clamped Scaffolding in New York—Cauldwell & Wingato, Building Contractors



CARPENTRY

Good Practice in Frame Construction and Finish

How to Frame a Roof of Unequal Pitch

By RICHARD M. VAN GAASBEEK

School of Science and Technology, Pratt Institute, Brooklyn, N. Y.

LAYING out the valley rafter in our problem will be described in this issue. The length of the valley rafter is determined in the same manner as the preceding hip rafter. Take the run from the lay-out, Fig. 1, measing from the return on the facia line to the butt joint against the hip rafter, A-T, Fig. 14, or 13⅝ in. Press the fence firmly against the top edge of the stock to be used and produce the facia line or first plumb line to the extreme right, A, Fig. 14.

Slide the fence to the left and measure on a level line from facia line A, the run of the hip, 13⅝ in., and produce plumb line T, Fig. 14, the extreme length of the rafter forming the butt joint against the hip rafter.

To simplify picking up the bevels, top cut, and other measurements required in laying out the valley rafter, draw in a section of the valley and plate, full size on the lay-out, Fig. 1, as shown in the section, Fig. 15, which is a section through S-S, Fig. 1.

Where the center line of the valley rafter intersects the facia line, square a line across at right angles to the center line, intersecting both edges of the valley as at A-A, Fig. 15. Also where the outside edge of the valley intersects the wall line, square a line across at right angles to the center line, until it itersects the ceter line as at 3, Fig. 15.

To complete the lay-out of the lower end of the valley, measure in on a level line, the diagonal distance of the projection, A-B, Fig. 15, from facia line A, on the side of the rafter, or 2½ in., locating wall line B, Fig. 14. Square this line across the bottom edge of the rafter and locate the center point.

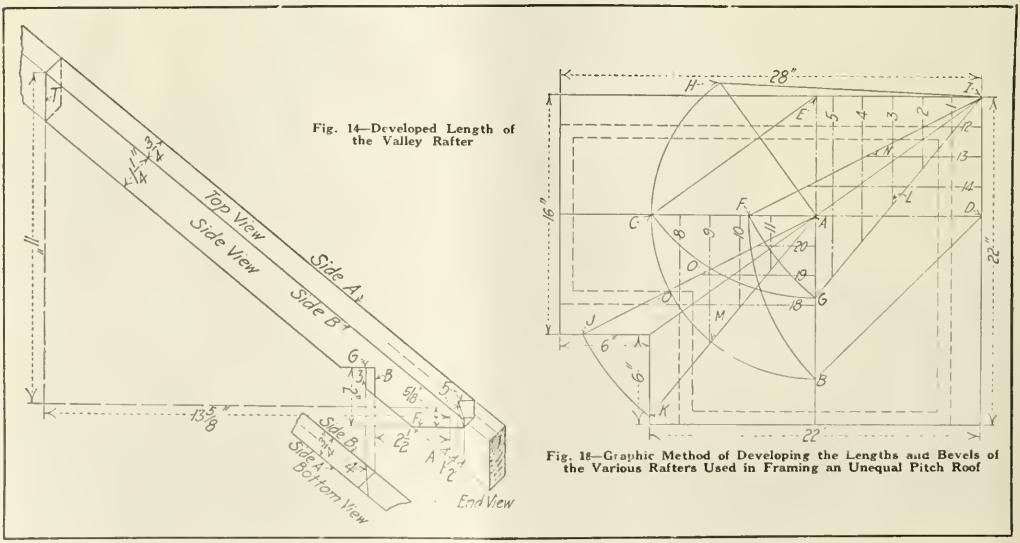


Fig. 14—Developed Length of the Valley Rafter

Fig. 18—Graphic Method of Developing the Lengths and Bevels of the Various Rafters Used in Framing an Unequal Pitch Roof

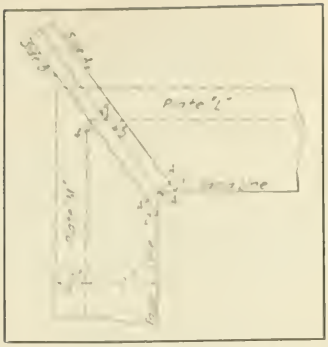


Fig. 15—Full Size Section Through S-S, Figure 1, Showing Intersection of the Valley Rafter, Plate and Fascia Line

To make a fit against the wall at the proper angle, measure in on the side of the rafter from wall line B, the distance B-3, Fig. 15, and produce plumb line 3, Fig 14. Connect plumb line 3 through the center of plumb line B, on the bottom edge as shown at 4, bottom view, Fig. 14.

To complete the birdsmouth measure down on facia line A from the top edge of the rafter, ⅝ in., the width of the facia and produce the plancher level F. Measure up from plancher level F on a plumb line 2 in., locating plate level G. The valley rafter crosses plate L, the same plate upon which the long common rafters rest, therefore the distance between plancher level and plate level is the same for the long common jack and common rafters and valley rafter

To make the return on the facia line at the corner of the building, measure forward on side A of the valley rafter from facia line A, the distance A-1, Fig. 15, and produce plumb line 1, Fig. 14. On side B measure forward on a level line from facia line A, the distance A-2, Fig. 15, and produce plumb line 2, Fig. 14. Square facia line A, across the top edge of the rafter and locate the center point. Connect plumb lines 1 and 2 on the side of the rafter with the center point on the top edge as shown in the top view at 5, Fig. 14. Cut on bevels 5 on the top edge and plumb lines 1 and 2 on the side of the valley for the facia, on line F for the plancher level.

On line G make a square cut and on line 4 on the bottom edge of the rafter a bevel cut for the birdsmouth and on line T for the butt joint against the hip rafter.

To Lay Out the Ridges

The run of the ridges is taken from the lay-out, Fig. 1. For ridge C, measure the extreme length from the facia line to the intersection of the center line of the hip and valley rafters and ridge. From this length deduct one-half the thickness of the valley rafter measured on the line of ridge C, or one-half the diagonal thickness of the valley T-W, Fig. 16, and locate the center on the top edge.

Set a bevel square on the lay-out to the angle formed by the intersection of the valley and ridge C. Apply the bevel on the top edge of the ridge and draw a line through the center point thus obtained.

For ridge D, measure the extreme length from the facia line to the intersection of the center line of the hip and valley rafters and ridge. From this length deduct one-half the thickness of the hip rafter measured on the line of ridge D, or one-half the diagonal thickness of the hip T-W, Fig. 16, and locate the center point. Set a bevel square on the lay-out to the angle formed by the intersection of the hip and ridge D. Apply the bevel on the top edge of the ridge and draw a line through the center point thus obtained.

To Assemble the Roof

Assemble the rafters as shown in the model (June issue). Set up and fasten the hip and valley rafters first. The center line of both rafters must intersect at the apex. Set up ridges C and D, securing them in place at the proper height by a pair of common rafters. The top edge of the ridges is kept flush with the top edge of the common rafters. This drops the ridge out of its normal position, and prevents the need for backing the ridge and thus throws the top edge out of alignment with the top edges of the hip and valley rafters.

Both ridges are not on the same level. One ridge is lower than the other, owing to the steeper pitch. If the ridges were backed to the pitch of the roof and the lines of the common rafters were continued to the extreme point, all lines would terminate in alignment with the extreme high point formed by the intersection of the hip and valley rafters.

The roof boards continue these lines up so that when the roof is completed all roof surfaces are in alignment. The exact location of the ridges where they intersect the hip and valley rafters may be determined by their location with reference to the butt joint of the hip and valley.

Draw in a section of the hip, valley and ridge, full size, on the lay-out, Fig. 1, as shown in the section Fig. 16, which is a section through V-V, Fig. 1. Square a line across at right angles to the center line of the hip at the intersection of the hip and valley rafter as at R, Fig. 16, thus establishing the butt joint between the two rafters. The distance R-S, Fig. 16, gives the distance between the butt joint and the long point of the bevel of the ridge on the side of the rafter.

Development of the Rafters on the Plan

Fig. 17 will serve to illustrate and prove the lengths and bevels and will explain in a graphic way how they are obtained.

A to B is the rise of the long common rafter.

A to C is the rise of the short common rafter.

A to D is the run of the long common rafter.

A to E is the run of the short common rafter.

B to D is the length of the long common rafter.

C to E is the length of the short common rafter.

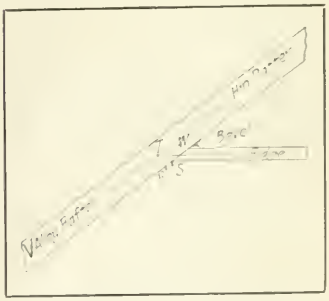


Fig. 16—Full Size Section Through V-V, Figure 1, Showing Intersection of the Hip and Valley Rafters and the Ridge

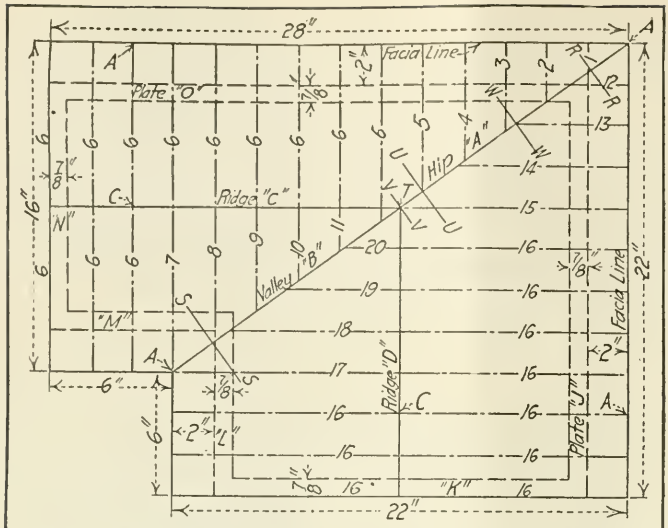


Fig. 1—Plan of Hip and Valley Roof of Unequal Pitch. Repeated for Reference.

D to F is the developed length of the long common rafter.

E to G is the developed length of the short common rafter.

A to H is the rise of the hip and valley rafters.

A to I is the run of the hip and valley rafters.

H to I is the length of the hip and valley rafters.

F to I and G to I are the developed lengths of the hip rafter.

A to J and A to K are the developed lengths of the valley rafter.

Angle L gives the top cut for rafters Nos. 1, 2, 3, 4 and 5. The lengths measured on the center lines of the jacks from the facia line give the developed length of each rafter.

Angle M gives the top cut for rafters Nos. 8, 9, 10 and 11. The lengths measured on the center lines of the jacks from the center line of the ridge give the developed length of each rafter.

Angle N gives the top cut for rafters Nos. 12, 13 and 14. The lengths measured on the center lines of the jacks from the facia line give the developed lengths of each rafter.

Angle O gives the top cut for rafters Nos. 18, 19 and 20. The lengths measured on the center lines of the jacks from the center line of the ridge give the developed lengths of each rafter.

Runs and Lengths of the Rafters

The following table is prepared to assist the reader in checking up his work. It is intended that the framer will take his runs from the lay-out and develop the lengths with the steel square and fence.

using the tables only as a matter of information, giving him the assurance that he has taken the proper runs and determined the correct lengths of the rafters.

The measurements listed in the table are the extreme lengths on the center lines. Make allowances where rafters intersect a ridge, hip or valley rafter for the cutting lengths. It is suggested that the reader frame a model of the roof for practice, building it to the same scale as the lay-out, 1 in. to the foot. In using the table to check the model, read feet as inches; for example, rafter 1, the run would read $1\frac{5}{12}$ in., and the length $2\frac{5}{12}$ in. The square being laid out in twelfths of an inch, it is an easy matter to check the work up accurately.

Figures to use on the steel square: Long common rafters, 12 in. on the tongue and 12 in. on the blade. Mark on the tongue for the plumb cut and on the blade for the level cut. Short common rafters, 16 in. on the tongue and 12 in. on the blade. Mark on the tongue for the plumb cut and on the blade for the level cut. Hip and valley rafters 9 8/12 in. on the tongue and 12 in. on the blade. Mark on the tongue for the plumb cut and on the blade for the level cut.

RUNS AND LENGTHS OF RAFTERS USED IN FRAMING ROOF OF UNEQUAL PITCH

Number of Rafter	Quantity of Rafters	Runs Ft.	Runs In.	Length Ft.	Length In.	Kind of Rafters
1	1	1	5¼	2	5¼	Jack rafters on short common side
2	1	2	10½	3	2¼	Jack rafters on short common side
3	1	4	3¾	7	4	Jack rafters on short common side
4	1	5	9	9	9⅜	Jack rafters on short common side
5	1	7	2¼	12	2¾	Jack rafters on short common side
6	12	8	0	13	7¼	Short commons
7	1	8	0	13	7¼	Jack rafters on short common side
8	1	6	6	11	05⅝	Jack rafters on short common side
9	1	5	0¾	8	7¼	Jack rafters on short common side
10	1	3	7½	6	1⅞	Jack rafters on short common side
11	1	2	2¼	3	8⅝	Jack rafters on short common side
12	1	2	9	3	10⅝	Jack rafters on long common side
13	1	5	6	7	9⅜	Jack rafters on long common side
14	1	8	3	11	8	Jack rafters on long common side
15	1	11	0	15	6⅝	Jack rafters on long common side
16	10	11	0	15	6⅝	Long commons
17	1	11	0	15	6⅝	Jack rafters on long common side
18	1	8	3	11	8	Jack rafters on long common side
19	1	5	6	7	9⅜	Jack rafters on long common side
20	1	2	9	3	10⅝	Jack rafters on long common side
A	1	13	7½	17	6	Hip rafter
B	1	13	7½	17	6	Valley rafter
C	1	17	9	17	0	Ridge
D	1	14	0	14	0	Ridge

OFFICE and JOB MANAGEMENT

Things the other man has found out that save money



How We Find Actual Cost *of* Building

By LEWIS BOWMAN

CONTINUING from the August issue a description of how to determine the actual cost of a building we give here a few more of the forms we use for the simplification of our work.

With the present greatly increased prices of materials and labor, this method will undoubtedly receive favor among a number of architects and builders doing smaller work as it is already the basis for figuring much of the larger type of commercial and civic work today.

Anyone in the competitive building business today realizes that the cut-throat competition now existing is at fault and all have witnessed the builder or sub-contractor who gobbles up everything in sight at ridiculous prices and who evidently hopes to "make it up" on some slip of the plans or specifications finally blows up in smoke leaving behind a batch of poorly executed buildings and a number of irate owners—while his competitors in the game have worried themselves over trying to meet his prices and have unconsciously placed themselves in a position to offer inferior work to meet this wayward business anarchist.

From our experience, I feel that by standardizing one's cost by some intelligent method of producing a bid this fault in the prevailing system can be corrected, for if an architect secures five bids from supposedly respectable builders and upon opening them finds that four of them have submitted about the same price and the fifth one was submitted way below—he is naturally suspicious and if he is a good business man will reject the foolish proposal or ask the builder for a re-consideration.

I do not believe that such an estimating system as we ourselves have used will act as a sure preventative for the odd turns and peculiar things that happen but it will greatly help to give one self-assurance concerning the bid submitted.

A copy of the form, shown in Fig. 3, is given to the owner, and it gives him a comprehensive idea of his building from a business point of view.

As the average man of today who has amassed the young fortune that is necessary to build his ideal of a house is a good business man, he will greatly appreciate the business ability of his builder in having such a system.

We have long felt that the public is entirely too unappreciative of the business end of the building business and often seems very surprised at the detail that goes on in the office of a progressive building contractor of today. They only too often believe that all that the builder needs to construct a house with, are complex looking piles of lumber and materials, a gang of men whom they collectively call "laborers" irrespective of their skill or trade, and a few blueprints.

By advertising and practising business methods and showing a man how the "wheels go round" you can very often secure much better co-operation than the average builder usually achieves with his client.

Business methods on the part of the builder are very necessary for making a favorable impression. Confidence is an asset that is hard to obtain, but, when secured, it means much for any sort of business, and especially that of the building contractor.

To give a prospective home owner an estimate merely written on your office stationery does not carry the weight of a printed form that is neatly filled out by typewriter.

Some sort of printing on the top, such as "John Jones, Progressive Builder, Des Moines, Iowa," produces a good effect. Your local printer will turn these out for a few dollars, and you only need a few hundred on hand; but, on the strength of your estimates going out in this form, you can safely add $10.00 more on your bid and be sure of getting the order. Style counts.

There is a psychological effect in having good stationery, and if you carry this through all the way on your business forms you will find that the confidence of which we have already spoken will be strengthened so much, indeed, that people will be willing to pay a little more because they feel that they are in the hands of a man doing business along business-like ways.

Nowadays it is not even necessary to go and print up the common forms, as these can be secured already printed by some firms making a specialty of this line of business.

For a builder to accurately total his costs in a bulk on any particular job is a comparatively easy task—all he need to do is charge the items in the mason work or carpenter work or to whichever branch or branches of the building that he does himself and does not sublet to another contractor. But to be able to charge accurately the time and material spent on each item of the mason work or carpenter work etc., is the all important thing for him to know in estimating.

Different Forms for Keeping Record of Costs for Masonry, Carpentry and Painting Used by the Author in His Daily Work of Building Suburban Homes.

Fig. 4

Fig. 5

Fig. 6

Only two classes of builders can do this—one the small-scope builder who is "foreman" on his own work and can watch the men and make out his own cost distribution, and the other the business-like builder who has his time sheets so systematized and his purchase orders and shipping tickets so properly made out, that with small additional office help the cost record is so automatically kept that it gives him the requisite total for any item of the work.

This is particularly true of mason work, where nearly everything is measured in square or cubic yards and feet. As the unit cost is the most essential knowledge for an estimator to know, this part of the system, mainly the unit cost should be the most carefully kept record in the office, with the possible exception of the total of the time and the material expended on the job.

As the varied working condition of the job make such a wide difference in various branches of the work, these subsequent conditions in the unit cost should be taken to account. For example, a unit cost based on excavating loamy earth should not be used, where to one's full knowledge the ground is full of clay or gravel, and unit costs of stone work that are based on the use of easy spliting ledge rock of the sandstone variety used where a cross-grained igneous stone such as granite is to be used in the wall and foundations.

Of course much of this is entirely superflous to a time-tried and experienced builder—but as the losses in building operations are in great evidence there must be some indulging reason, and the reason is plainly one of faulty estimating, for a builder who estimates his work properly and figures a definite amount for profit cannot fail. The main object of the following description of cost record keeping however is not to suggest methods of estimating for the average builder can do that, but to get in proper form the data that a man may well know today but forget tomorrow.

The sheets given in the illustrations are not made for the builder's knowledge of the work but as a receptacle for that knowledge after it is obtained and so averaged that it can be referred to at a moments notice and all the data placed on a few concise pages. It is the "bookkeeping" of a builder without being the ledger itself.

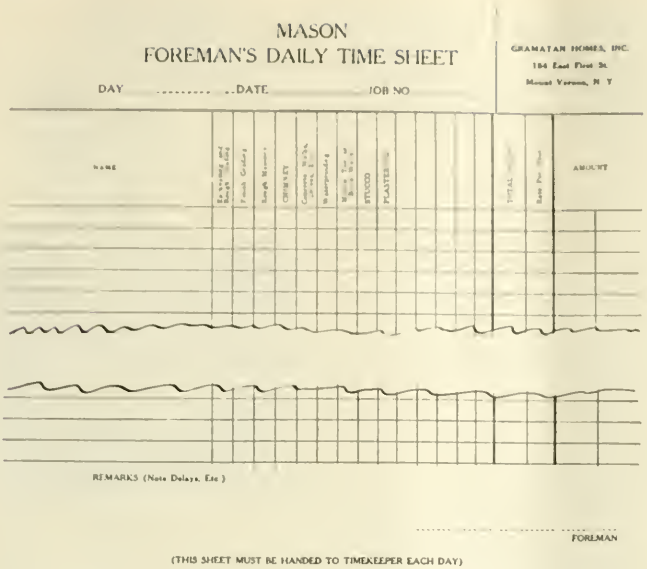

MASON
FOREMAN'S DAILY TIME SHEET
GRAMATAN HOMES, INC.
184 East First St.
Mount Vernon, N. Y.
DAY ..... DATE ..... JOB NO.
NAME
AMOUNT
STUCCO
PLASTERING
REMARKS (Note Delays, Etc.)
FOREMAN
(THIS SHEET MUST BE HANDED TO TIMEKEEPER EACH DAY)

Fig. 7

Fig. 4 gives an example of a mason cost record sheet; Fig. 5 a carpenter work sheet and Fig. 6 a painting sheet; these being the three branches of construction that our concern performs. In spite of all our careful planning before having these sheets printed, some additional sub-heads come to light occasionally and space has easily been found on these sheets as all of the columns are scarcely filled.

To explain the working of the system we can take as an example the mason sheet. The mason foreman on a certain job hands into the office at night a time sheet containing the names of all men working under his department on that particular job (the time sheet is shown in Fig. 7). The time is distributed according to the kinds of the work multiplied by the rate of each man per hour and the total amount in money placed in the column. This is done by the foreman and checked over by one of the clerical staff for verification as each man's pay is made up according to the number of hours he worked during the week. This sheet then goes to the office man who keeps the cost record book and he takes off the total of the cost for the day—on the foundation, chimney etc.—and enters that total daily in the column marked "Labor." The sheet then goes to the bookkeeper and he enters the cost total for the day in his ledger but not attempting to sub-divide it.

Material shipped from the yard and purchased outside in the same manner is distributed in the columns marked "material" instead of marking the name of the material we give the ticket number for each in entry and in case a question arises, this ticket is found in the files. The ticket also goes to the bookkeeper and is entered in his ledger. The bookkeeper naturally has nothing to do with cost distribution but merely charges labor and material in bulk, but he does make the separation according to the departments. A summary of the entire job is made on the form shown in Fig. 8.

By this system there is a way to check the cost record by the ledger if both are kept up-to-date. We have found that the above system has worked as easily as any office system that has come under our observation and in offering the explanation of it, I am merely giving a practical example that has been of great use to ourselves.

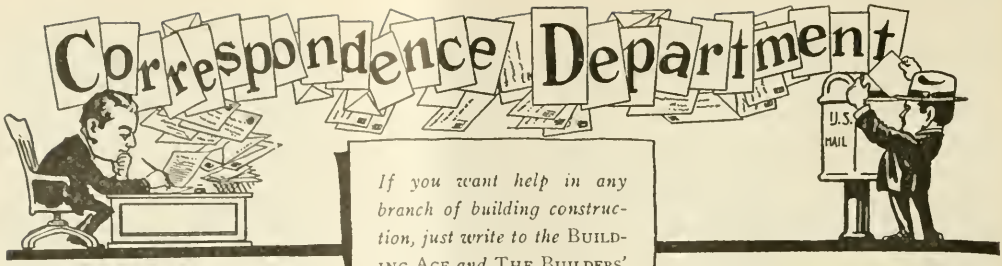
Many builders doubtless have one system that has worked for them, but the strange thing about the business end of the building business is that there seems such a scarcity of official efficiency organizers such as are available for other kinds of business and professions that can give a builder help when he wants to systematize his business.

I can truthfully say that this system is the product of the experience of men at the heads of our estimating and construction department and was compiled from their suggestions and was arranged in a manner to give them the greatest benefit as a record.

A knowledge of actual costs of a job is of vital importance to the building contractor. He cannot afford the risk of not knowing just exactly where he stands regarding the profit or loss on each job.


SUMMARY
1. Mason Work
2. Timber and Lumber
3. Trim Lot
4. Carpenter Labor
5. Stairs
6. Tinning
7. Plumbing
8. Heating
9. Electrical Work
10. Hardware (Rough)
(Finish)
11. Painting
12. Decorating
13. Tiling
14. Mantels
15. Art Glass
16. Gas and Electric Fixtures
17. Refrigerators
18. Shades
19. Awnings
20. Screens
21. Gas Service (15c. per ft.)
22. Walks
23. Drives and Gutters
24. Finish Grading, Seeding and Sodding

Fig. 8



If you want help in any branch of building construction, just write to the BUILDING AGE *and* THE BUILDERS' JOURNAL *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

A Good Basement Wall

THE concrete block has its drawbacks as a material for basement walls. Its strength and rigidity, and its lasting qualities as well as its cheapness, all favor its use. But one outstanding fault is that it is not immune to moisture conductivity. Concrete blocks, due to the way in which they are made, are semi-porous and it is this characteristic which causes them to fall down when posing as an ideal material for basement walls.

Tile blocks, on the other hand, because they are more dense and more nearly insulated, score higher than the concrete block. But tile is not so desirable for a foundation wall above ground as is the concrete block. Due to its unfinished appearance the tile blocks, even when glazed, have a sort of rough and ready look that mars a smooth consistency of good looks.

But by using tile from the bottom of the basement to the ground line, or slightly below, and then concrete blocks above this, the effect is all that is desired and the wall will not show up any bad traits later on during a wet season. Such a wall is shown in the photo and it will be seen that the two materials work very nicely together.



This is but a suggestion which one contractor has found quite valuable, as it provides a waterproof wall below ground and an attractive wall above. Of course, the tile could be extended to the sill and the exterior coated with stucco or a cement wash, but this is more expensive.—**Dale Van Horn.**

Are Customers Unwelcome?

WHY do some architects have such forbidding looking offices? Recently I called on a firm of architects and the reception room was a narrow 3 by about 10-foot passage. You could see nothing of the office, but I could hear different individuals talking. A push button bell was put there to attract attention. I rang this a few times, but no attention was paid.

One man came out while I was standing there, through a double swing door, which reminded me of the old saloon days of anti-prohibition time, but he was too busy to more than glance my way.

I called at this office in response to some matter that they were interested in. I was a little amused at first, in the lack of method they had. Finally, after waiting for about fifteen minutes, I became disgusted and departed.

It would take a crowbar to have me go back to that establishment again.

Both architects' and builders' offices should be open enough so that when a visitor calls, he will at least receive attention.

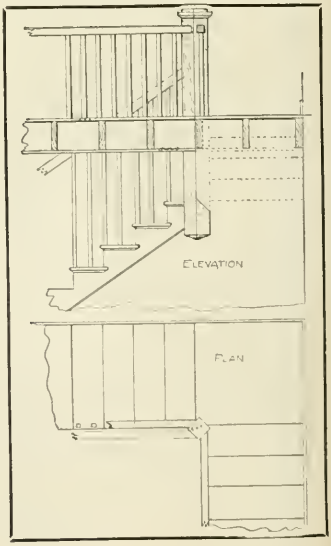
One's office entrance should be attractive, not repellant to possible customers.—**A Builder.**

Setting Newel Post

I AM sending you a drawing of an arrangement of a stair of which I promised you some time ago.

In so arranging the post at landing it does away with cutting of short balusters under the well hole, placing the post on an angle receives all of the rails with plenty of room for the hand to pass the well skirting board, and does away with cutting the rail off at winder, making a better looking job with less material and less work in erecting.

I have used the arrangement for a number of years with satisfaction. It will work on iron stairs also, doing away with a double newel. I think the drawing makes the plan clear enough for practical purposes.—**A. P. Stone.**



Shingling Seat

BY finding a far better way to stick to a roof while shingling it than by toe clips, I take time to explain a simple plan to those who are interested.

It saves driving any nails in the shingled roof which might cause a leak, and besides you can always have a position that is convenient for nailing. Though you see in the picture that it is very easily made, I will give just a few words to explain.



Take a couple of one by six-inch boards and cut them the same pitch as the heel of the rafter so that when they set on the roof they will make a level seat. Now take two wide shingles and nail the thick end of one on one of the one by sixes and the thin end on the other, and the other shingle nail it on just opposite, then brace the seat out on the end with two narrow shingles as shown in the picture.

Now to make it stick to the roof get some six penny box nails and drive them in about an inch apart on the edge that sets on the roof, leaving about a half of an inch sticking out, then crook them over, leaving just the sharp edge of the head sticking out.

You now have a seat that is safe to shingle with on any roof, even to that of a half pitch.

By using this means of sticking to the roof and by shingling with a hatchet gage as seen in picture on hatchet, you can take from six to nine rows of shingles at a time, and be in a convenient nailing position for all.—**Loy E. Owen.**

Estimating Brick Work

IN a recent number of the BUILDING AGE is an article by Mr. Wm. Carver, Architect, on "How to Estimate Brickwork." He advances some good suggestions for taking off quantities but seems to be misinformed as to the labor required per sq. ft. of wall. If I understand his figures correctly he would have a bricklayer lay 1,000 brick in less than seven hours in "Ideal" wall.

My opinion is, that the average contractor who figures on that basis on residence work would want to figure in all the openings, figure the corners twice and then add a substantial per centage or find himself headed for the bankrupt's court.

I have had a little experience with the all rolok wall, a wall where there was no cutting required and the conditions being good to get the best results, pressed brick laid in lime and cement mortar with the joints struck on both sides of the wall, the bricklayer's time averaged 10¼ hours per 1,000 brick. You might say that the work was done by incompetent mechanics, or that there was a lot of loafing on the job, but that is not the case.

On residence work with the usual angles, piers that require chipped brick and other difficulties it would require more time.

For ten-inch hollow walls on residence work a bricklayer is doing well if he can average 100 brick per hour and if there are soldier courses, brick sills or fancy bonds, 50 brick per hour is sometimes too many to safely figure on, and even that number is entirely too many when they are under the watchful eye of some of the more exacting architects.

As to the "Ideal" being the only type of masonry wall where furring can safely be omitted we are not convinced, there being too many practical examples to the contrary.

There are several houses in this section constructed with ten-inch hollow walls plastered directly on the brick, they are all in exposed locations; exposed to the weather on all sides yet there is no trouble whatever with dampness, they are warm in Winter, cool in Summer and giving entire satisfaction to the owners and tenants.

We also have some hollow tile buildings that are plastered directly on the tile with stucco exteriors that are equally satisfactory, the cost being practically the same as for a ten-inch common brick wall.

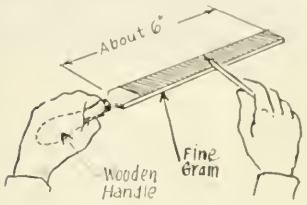
Although I would increase Mr. Carver's labor costs, I still agree with his statement that the average brick house can be built with a very small increase in first cost over that of frame construction.

William H. Welch.

A Pointer on Sharpening Pencil Points

IT is the common practice of draftsmen in making layouts, to sharpen their hard lead pencils on sand-paper pads. I wish to point out that the use of a small fine metal file as illustrated below is a simple and vast improvement over the sandpaper pad practice. Fine sandpaper will wear the lead smoothly but will not last long; the coarse sandpaper will endure but will not wear smoothly and with difficulty.

On the other hand the metal file's fine, firm grain will wear the hardest lead smoothly and quickly and needs but occasional dusting to remove its lead deposit; and, of course, it will outlast ten sandpaper pads. By a piece of string attached to its handle, the file may be conveniently suspended from a tack in the table edge in the usual way.—**C. Nye.**

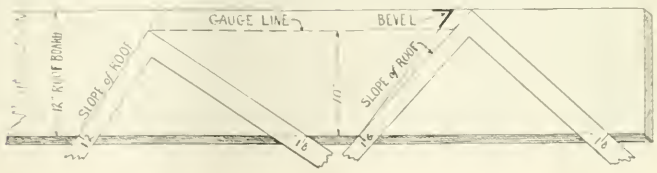


Cuts for Roof Boards

FINDING the cuts for roof boards in a valley formed by the joining of two roofs of different pitches is not such a difficult matter if one could see it, as it really is.

Here is a way to find such cuts with a steel square applied directly upon the roof board to be cut. The square laid on 12" and 18" shows a 3/4 pitch and the square on 16" and 18" shows a 9/16 pitch, and this solution shows how the roof boards laid on the 3/4 slope are cut to line up the valley. To find the bevel for opposite side of this valley this same method applies by changing figures accordingly. Here is the analysis or explanation:

This 12" roof board laying on the rafters of the 3/4 pitch roof has a 10" rise as shown by the square which indicates that pitch. Now draw a guage line from the corner of that square as shown and again apply the square, this time on 16" and 18" and the 16" line is the pitch of this 9/16 roof and the guage line just drawn shows where the 12" roof board must reach with its upper, or longer edge. It now but remains to square up from this point so as to get this point on the upper edge. Now draw the correct bevel as shown and this is also the cut of hip shingles on the 3/4 pitch side of the valley.—**C. A. Doner.**





Artistic Back Yard Fences

BEAUTY can be secured even in such a prosaic thing as a back yard fence. The above picture shows an easily constructed but very artistic fence. The picture below shows where a pergola has been erected in the rear of a back yard so as to form a background.

There is nothing elaborate about this. It is simply and easily made, still it is quite artistic. The diagonal lattice work at the rear of the pergola is likewise carried out in the side fences. The floor of this pergola is cemented and blocked off into squares.

Here is a type of construction to go after for fall business. If no contracts for houses can be secured, there are plenty of contracts that can be secured for this type of work if the proper suggestion is made to the owner.



What the Editor Thinks

Fall Building

SEPTEMBER, in the past, has been the month of finishing up the jobs on hand and getting ready to lay up for the winter period. September now means one of the best months of the year for securing new contracts.

It is a good month to go actively after business and for the majority of small home operations you can give the promise that the owner will spend his Christmas and New Year's under his own roof in a brand new house that contains all the modern improvements.

Do not overlook the opportunity of getting Fall business!

Uncertain Plans

ONE of our readers calls to our attention, the note found often enough on plans "contractor to verify all measurements on plans before building." Here is a state of an architect not being sure of himself. Of course, we are all human and liable to make mistakes, but it is hardly the square thing to put the blame for our mistakes on another. The architect should shoulder his own responsibilities and so should the builder.

The habit of making pencil drawings only should be discouraged.

Inking a tracing takes a little extra time, but when done it results in better blue printing and will tend to prevent mistakes.

Will High Prices Cause a Building Depression?

IN a recent letter to different trade associations, Franklin D. Roosevelt, President, American Construction Council, says that if we are to keep construction activity steady and stable for the next five years, in view of the volume of work that should be done, we must constantly avoid periods of skyrocketing either in price of materials or wages.

While the demand for the moment may make possible inflated prices in wages above the regular scale, it will only prove a boomerang if the public decides to stop buying again.

Isn't it better to forego temporary advantage, if by so doing the industry is kept moving at a steady, stable, healthy pace continually?

A New Line for Builders Work

THE automobile has worked many changes in our daily life. Quite a number of families when they are out on the road in their car make a habit of buying their fruits and vegetables direct from the farmer. This has caused the farmer to display his produce by the roadside.

The farmer or some member of his family sits by the roadside waiting to make their sales and in a few instances use a sun shade or rough shed for protection from the sun.

The next step in this roadside merchandising will be the erection of decent-looking market buildings. Structures of this sort should not only be convenient with respect to the handling of products displayed, but also present an artistic appearance—something that will not be an eyesore along the road, but on the other hand will attract the passing automobilists to stop.

Our Cover Design

THE scene on our front cover this month is one that will strike home to every builder. The owner and his wife come out to inspect how the work is getting along. The builder is explaining different points of the construction. The lady is all attention to what is being said, it is *her* home. It is the wise builder that caters to the ladies, their recommendation is worth while having. This picture is reproduced from an original oil painting prepared especially for us by the well-known artist, Mr. David C. Hutchison.

More Cellar Windows

OUR cellars do not receive enough daylight. There is no reason why they should be dark, in fact, on the other hand, it is far better that they be light. The little single windows of the present and bygone days should give way to double or triple windows.

It is up to the builders to sell this idea of better lighted cellars to the owner. It has just simply been a case of following what our ancestors did.

Today, when metal sash and frame cellar windows can be had so cheaply, very few owners will hesitate about adding a few extra windows as the cost is so small. "Let there be light."

Finishing Trim to Match Furniture

IN an article in this issue on staining and finishing trim, different methods of finishing are described. There is nothing that mars or enhances the appearance of a room so much as proper finish of the trim.

It is but a simple matter to ask the owner, before you order the trim, just exactly what the finish is to be, as in that way you can give them more satisfaction. The difference in cost between certain woods is so very small when compared with the total cost of the building that it practically amounts to nothing and it means so much to do a good job. The owner will be more than satisfied and pleased and that is the best advertisement any builder can have.

Suppose a party has a handsome Circassian walnut bedroom suite and you finish off the trim in the bedroom where this is to be placed, in mahogany stain, one will scream at the other and no one will be satisfied.

A little thought on this subject will produce satisfaction all around. Select the proper woods for the desired effects.

Mortising Machine

THE making of a mortise by the old hand method is too slow and expensive in these days of high wages, therefore the device made by the Colgan Machinery & Supply Company, 801 Hayden Building, Columbus, Ohio, will be of interest to every builder.

It is a low-priced device that is quickly operated and a descriptive circular will be gladly sent to any of our readers who may be interested.

Efficient Power

ON the job and in the shop, there are many uses for power, and a very efficient and compact gasoline engine is made by the New-Way Motor Co., Lansing, Mich.

It is specially useful for operating portable machinery, as it is light in weight and easily transported. Their circular, C20, fully describes this engine, which is made in different sizes from 2 to 5 H.P.

Artistic Roofs

THE Blue Ridge Mountains are famed for their beauty, and slate from this region has a deep, lustrous, blue-black tone. This is now being used for coating asphalt roofing, and the result is a handsome and striking roof.

A sample and descriptive literature about this roofing may be obtained by any of our readers who may be interested by writing to the Blue Ridge Slate Corporation, Esmont, Virginia.

Smaller Registers

SPACE and money can be saved by using the H. E. Floor Register. These are described in folder "J" just issued by the Hart & Cooley Co., Inc., New Britain, Conn.

To secure strength the webs of the old-time cast-iron hot air register were necessarily quite thick. With the pinched-up fretwork used in this new style register, the same heating capacity is obtained in about half the space.

Weather Strips

FOR Fall business, it is a good idea to talk weather strips, and many a builder can secure desirable orders by going after this line of business.

A complete description of metal weather strips and details of attaching them, may be obtained from the Diamond Metal Weather Strip Company, Columbus, Ohio.

Metal Ventilator

RATHER interesting is the descriptive circular issued by the Danzer Metal Works, 123 West Lee street, Hagerstown, Md.

This describes their rose top ventilator, which is built like a chimney on the open stack principle with a top and side rim to exclude the weather without interfering at any time with the maximum air discharge.

Useful Catalogs

ON this page we give short descriptions of some very interesting catalogs, etc., that have just been issued by different manufacturers.

They will be sent free on application to any of our readers who are interested, but should you prefer to write us, give the date of this issue and title of the catalog desired, and we will have them sent to you.

Pipeless Furnace

VERY interesting is the 6-page descriptive catalog issued by the Co-operative Foundry Co., of Rochester, N. Y., describing their Red Cross Empire Pipeless Furnace. Some very useful information is given, together with a table of sizes and capacities so that the selection of a proper size heater can be easily determined. It is certainly worth while sending for this useful publication.

Clothes Dryer

THE builder who wishes to make a complete job of his residence construction, whether it be a small bungalow or a large apartment house, will consider supplying the means of adequately drying clothes. This is another of those little things that will help please the lady folk and will give a good name to the contractor. A very interesting booklet is issued by the Hill Clothes Dryer Co., of Worcester, Mass., which they will send to any builder on request; it contains illustrations and descriptions of different types of clothes dryers.

Brick Houses Easily Constructed

BY the use of the Fisklock hollow building bricks, a wall is rapidly constructed, as a unit is 8 inches thick and it is laid up as readily as a single brick. This makes for speed in construction. A very interesting folder containing details of this economical form of construction will be sent to any reader interested.

Ventilation of Buildings

NOTHING is of so much importance as the proper ventilation of schools, theatres, churches, halls, etc. Builders can obtain some very good information on this very important subject by obtaining the catalog of B. F. Sturtevant Company, Hyde Park, Boston, Mass.

Water Heater

CONTRACTORS who are on the lookout for new devices to please customers will be interested in the Economy combination boiler and gas water heater. This does away with the separate heater so often in the way when attached to a boiler in a small kitchen.

An interesting catalog describing such a heater has just been issued by the Economy Heater Company, 108 South La Salle street, Chicago, Illinois. The thermo valve control, which is a feature of this heater, insures an automatic supply of water at a desired temperature.

Plumbing Chart

AN interesting chart is published by the Copper & Brass Research Assn., 61 Broadway, New York City. It is a complete diagram of the plumbing of a typical residence. All the different water and drain pipes are shown in perspective form. It will be a handy thing for builders to have in their office, as it will be quite an aid in explaining to possible customers just how plumbing should be installed.

There are some convenient tables printed with the chart which gives sizes, etc., that will be very useful for reference. A copy of this chart will be sent to any reader of Building Age and The Builders' Journal on request.

Casement Hardware

THE builder who has a job of installing casement windows will find the work a good deal easier if he will refer to the interesting booklet just published by the Monarch Metal Products Co., St. Louis, Mo., as it contains a number of detailed drawings of exactly how to attach hardware to both inward and outward opening casements.

The booklet will be sent to any of our readers who are interested in this line of work.

Warm Houses

THEY are easily secured if one installs a proper heating system. Besides efficiency, economy is another very important consideration.

A very interesting booklet, edition "B," has just been issued by the Sills Stove Works, Rochester, New York, describing their Sterling Furnace, which is an improved type of the ever popular pipeless furnace.

Lathing Material

HOW the use of Clinton Welded Sheathing will save upward to 60% on plastering jobs as compared with the cost of wood lath and plaster, is interestingly set forth in the descriptive catalog issued by the Wickwire Spencer Steel Corporation, Worcester, Mass. They will also send a sample of their metal sheathing.



This view shows how snugly the doors hug the inside walls when open—allowing maximum space in the garage.

Set No. 805 Includes:

No. 29 Latch
1 Swivel Hanger
6-foot Braced Rail
Jap No. 505 T. P. Butts
No. 820 Chain Bolt
No. 830 Foot Bolt
No. 5 Pull
1 Pair No. 40 Padlock Eyes

When Every Inch Counts—

In designing and hanging garage doors there is no room to waste. Limited to narrow confines, the builder must choose a proper door hanger, rail and other accessories to the end that a maximum amount of room may be provided for passage of the car.

That's why National Sliding and Swinging Garage Door Sets No. 805 are so often specified!

In addition to allowing ample entry space, doors hung with these sets can be opened and closed just as easily in the winter as in the summer—no jamming by ice or snow.

These doors are easily operated, are weathertight, adaptable and require but a small space.

Remember—**National Garage Sets Safeguard the Reputation of the Builder.**

Write for our catalog today.

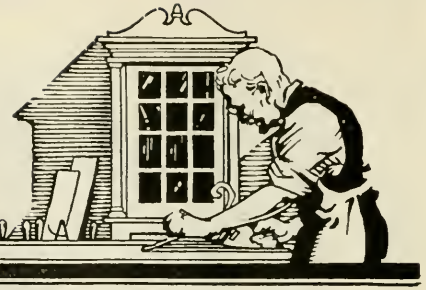
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SHOPWORK *and* FURNITURE

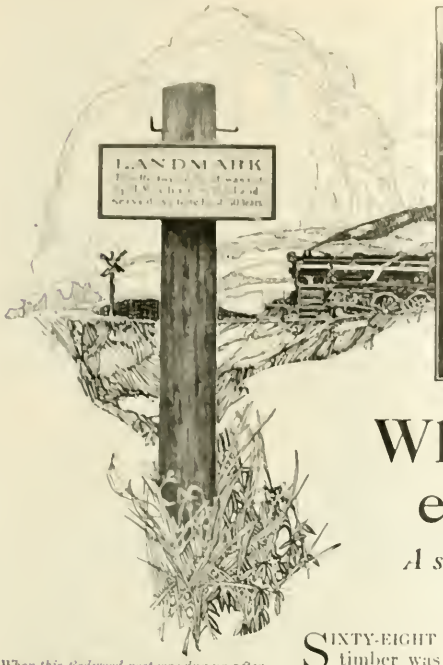
Designs for the Finish Man



Convenient Kitchen Cabinets

THE lady of the house is, of course, anxious to have her kitchen arrangements as convenient as possible, and one demand is for adequate cupboard space; therefore it will be interesting to examine this picture. A sink with drainboard on each side is well placed under a window, and for night illumination an electric light has been placed above it. Drawers on one side and cupboard on the other lend themselves as convenient places for storing away the different kitchen utensils. An innovation is the hood over the gas range, which has been let into the ceiling and extends up in the attic space above in this bungalow; thus there is no metal hood projecting in the kitchen and all the hot atmosphere goes out through this space, affording adequate ventilation.





When this Redwood post was dug up after fifty years, it was still free from decay, proving that worms, insects and moisture, earth acids and salts do not destroy Redwood.



Residence—Highland Park, Illinois. Robert Seyforth, Architect, Chicago. Exterior of Redwood hewn Shingles.

What other wood can equal this record?

A striking example of Redwood's special fitness for Residential Building

SIXTY-EIGHT years ago a Redwood timber was installed as a gate post on a western ranch. It gave fifty years of service before it was dug up to let a railway through. Now it is a landmark which perpetuates the name of a pioneer ranchman. Sound below ground and above ground, this post offers convincing testimony of Redwood's remarkable resistance to rot and decay.

Why Redwood resists rot

A *natural*, odorless preservative permeates every Redwood fibre during the growth of the tree. This prevents the propagation of fungus spores which cause rapid decay in most woods. It also protects Redwood against wood-boring insects and worms. No artificial preservatives are needed.

Where Redwood should be used

For siding and porch work on which climbing vines retain moisture and foster the development of mould and decay, for shingle roofs shaded by trees so that they dry out very slowly, for eaves and gutters—wherever moisture lodges—Redwood can be specified with perfect assurance that decay producing fungus will not make early replacement of these parts necessary.

The same natural preservative that protects growing Redwood against wood-destroying agencies during centuries of growth protects Redwood lumber and lumber products.

Why Redwood should be used

In addition to its rot-resisting properties Redwood is free from pitch and other highly inflammable resinous substances, therefore reduces the fire hazard wherever used. Being unusually free from knots, splits, checks and other defects, there is little waste in Redwood lumber. The builder's time is saved in working with Redwood. Having a close grain and smooth texture, Redwood takes and holds paint well. In a Redwood house, repair and up-keep expenses are reduced to a minimum.

Redwood should be specified for

Exterior Construction
including Colonial siding, clapboards, shingles, door and window frames gutters, eaves, water tables and mudsills—porch rail, balusters and columns—mouldings and lattice—pickets and fencing—pergolas and greenhouses.

Interior Finish
Natural, stained or painted. Wood block floors

Industrial Uses
Tanks and vats for water, chemicals and oil—Factory roofs and gutters—Wood block flooring.

Wood Specialties
such as—Caskets and burial boxes—Incubators and ice cream cabinets—Cigar and candy boxes—Furniture manufacturing, etc.

Railroad Uses
such as—Railroad ties and tunnel timbers—Signal wire conduits and water tanks—Car siding and roofing.

Farm and Dairy Uses
such as—Silos, tanks and troughs—Hog feeders and implement sheds—Wood block floors, etc.

For the convenience of architects and builders we have recently issued our "Construction Digest" and our "Engineering Digest." Our New York or Chicago office will gladly send these publications on request.

CHICAGO 2070 McCormick Bldg. — NEW YORK 832 No. 40 Rector St. Bldg. — SAN FRANCISCO 311 California St. — LOS ANGELES Central Bldg., 6th and Main Sts.

THE PACIFIC LUMBER CO. of Illinois — PACIFIC LUMBER CO.

"The Western Wood for Eastern Homes"

P L C

The Pacific Lumber Co.

Redwood

The Largest Manufacturers and Distributors of California Redwood



PAINTING

Practical Points of Interest to the Builder

Some Notes on Wood Finishing

By A. ASHMUN KELLY

SOME persons think of the term "weathered oak," as relating to one particular shade, whereas, there are at least thirty. And the same holds good regarding the term "English oak," of which there are some fifty different shades. These latter shades range all the way from a bright umber tone to a color that approaches green. Weathered, Mission and fumed oak are sometimes classified under one head. Weathered oak is obtained by the act of staining, while Mission and fumed oaks derive their coloring from the process of fuming. Their finish is effected with either shellac or lacquer, the final finish being wax.

The difference in finish between early English oak and weathered oak is very little, the former not being filled, while the latter is filled. In the latter case apply a a light coat of shellac before filling, and dull-rub for a finish.

The best results with English oak are obtained by first applying a stain, then a thin coat of white shellac; after which apply the filler, then a coat of white shellac, followed by a coat of varnish, which is to be rubbed to a dull finish. Or the varnish may be omitted and two or three coats of shellac may be applied instead, this saving much rubbing.

Butler oak once meant a grayish-brown sort of color, but now there is no standard color for this finish, the choice of color resting in the finisher, who may choose what he likes, and it will still be butler finish. One may see shades of color on this oak finish running from a grayish-brown to a red, or even to a greenish-cast. After staining the work was allowed to stand about thirty minutes, then the high lights were wiped out with a rag; the idea was to simulate the dirty effect seen on ancient oak, the result of much handling. Such realistic effects, we are glad to state, have now gone into the discard. Moreover, the process is much simpler now, no rubbing is now done, the staining is uniform, and the finish is simply two coats of shellac, one coat each of shellac and varnish. In cheap grades of furniture the color is rather brownish, something on the umber order, the finish being effected without a filler. Adam brown stain has an umber tone, with a slightly red undertone.

There are many shades of silver gray, and any of these shades may be obtained with the following formula: Mix together 1½ oz. powdered iron sulphate; 4½ oz. sulphate of soda, and ¾ oz. black Nigrosene aniline dye; dissolve all together in 6 quarts hot water. It is then ready to apply. After its application let it become dry and then give it a coat of white shellac.

If there is danger of dampness where this wood is to go, then apply a thin coat of shellac varnish, the white or bleached variety. On this apply two coats of banana oil. For a wax finish add a little dry zinc white to the wax, which is to be rubbed into the wood, then rubbed off so that none remains excepting that in the pores of the wood.

Kaiser gray is simply a darker shade of silver gray. Both are made from the same materials, but one is darker than the other. First stain the wood, and if a fine flake effect is desired apply a thin coat of shellac; when this is dry apply the white filler and rub as above indicated.

WOOD finishers differ in many important matters concerning the wood finishing art, but the directions given here will prove generally acceptable to most workmen and even to others.

Very expert wood finishers will be found who fill mahogany with oil stain the first thing; we think better results might be had by using a very thin coat of shellac instead of the oil stain. But be this as it may, one thing we will agree on, and that is, the wood should be dry in order to get a satisfactory and durable finish on mahogany wood. In mahogany filler benzine must not be used, as it will injure this wood, or at least the color of the wood. It seems to act as a bleach, and has the same effect on red and most bright colors. Benzine in the filler turns the pores of the wood gray, and by looking at the filled wood at a certain slant this effect is very plain. Some think damp lumber causes this, but while it is true that damp lumber injuriously affects the color finish, yet even with dry wood you will see the bleaching where benzine has been used.



For Beautiful Interiors

Enameled Woodwork is the "Last Word" for interior decoration. The secret of a fine enameled job is in the under-coat—it's like the foundation to a building—everything depends upon it.

Johnson's PerfecTone Under-coat is a perfect foundation—it is elastic, durable, non-porous, has great covering power, works freely under the brush and dries hard in from 18 to 24 hours.

Johnson's PerfecTone Under-coat will not run, sag, lap, chip, check, crack nor peel. It has wonderful smoothness and opacity—and will not absorb the Enamel.

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To Build Up Your Reputation

Johnson's PerfecTone Enamel is very elastic—it will not fade—chip—check—crack nor peel. The stock shades of Johnson's PerfecTone Under-coat and Enamel are White, Ivory and French Gray.

Won't you try Johnson's PerfecTone Under-coat and Enamel at our expense, so you can see for yourself what beautiful effects may be procured? Use the attached coupon.

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"The Wood Finishing Authorities"

I am willing to try Johnson's PerfecTone Under-Coat and Enamel. Please send me a pint of each Free and Postpaid.

The best dealer to carry your line of enamel is _____

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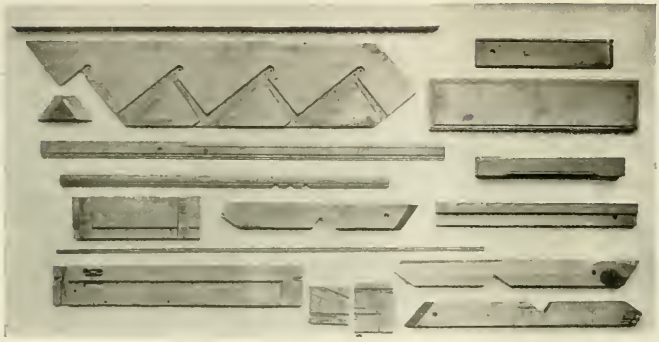
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WHAT'S NEW



New Materials and Equipment that Keep Your Work Up to Date



Woodworking in Variety Easily Accomplished

FOR the variety of work that must necessarily be turned out in the shop of the average contractor, quite an equipment of machines would really be necessary, and therefore it is of interest to see samples of the work accomplished by one machine called the Master Woodworker as manufactured by the Woodworker Manufacturing Company, Detroit, Michigan. This machine can be either used in the shop or taken on the job. It is operated by electric motor and of course can only be used conveniently where electric current is obtainable.

This machine is practically twelve machines in one. It is simple in construction, has but few parts, and the drive from motor to saw spindle is direct. The overhead saw is carried on a slide pivoted to swing for cutting at any angle and allowing the saw carriage and motor to be drawn back and forth, which is a desirable feature for cutting rafters, etc.

The machine is equipped with a graduated dial to cut compound mitres in one operation; this was specially designed for making jack rafter cuts. Besides cutting, boring, routing and mortising can be accomplished, as there are special devices to do this work.

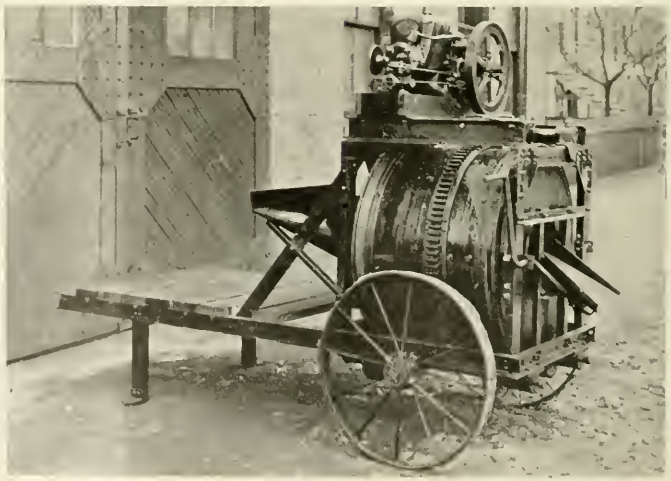
Our illustration shows a number of varieties of work that is easily accomplished by the use of this woodworker. This variety of work is accomplished because of the different appliances on this machine. Ripping at any angle and joint is possible on account of the tilting table, which is easily operated.

Improved Form of Concrete Mixer

THE use of a concrete mixer even on small jobs is economical practice, and we show below a new type of a small mixer that has a capacity of 3 cubic feet of wet concrete per batch. This is the new Archer Junior made by the Archer Iron Works, Chicago.

It was specially designed to meet the need among contractors for a batch mixer that could be handled by a small crew—that is absolutely dependable, simple to operate, easily portable and low in operating cost—also, and very important, low in first cost. It is operated by a 1½ H.P. gasoline engine.

With this mixer the materials are wheeled onto the low loading platform and dumped directly into the hopper. In many cases the mixer can be backed up to the forms and the mix spouted directly into place without the labor and expense of first transferring it in wheelbarrows.





City and County Building, Provo, Utah.
Joseph Nelson, Architect.

Keystone Copper Steel used for sheet metal work.

SHOULDERING the burden of your sheet metal problems is part of our daily work. More than that—we are prepared to furnish products that will help keep them solved. This is evidenced by our development of Keystone Copper Steel—the alloy which has established a new measure of service for building construction, and sheet metal work.

KEYSTONE
COPPER STEEL

Keystone Copper Steel is an alloy made by the addition of a certain percentage of Copper to mild steel, thereby greatly increasing its lasting and rust-resisting qualities under actual service conditions. It has been scientifically developed and tested—and its use is strictest economy.

The high reputation of our products is recognized wherever sheet metal is used. Each brand of our manufacture has behind it a service—the scope of which has a tangible value to every builder and sheet metal worker. This service begins with the planned care and skill in the making, which is carried through to the thorough system of distribution which keeps these products obtainable in every part of the country. For roofing, siding, gutters, spouting, eaves trough, sheet metal and tin work, use Keystone Copper Steel Galvanized Sheets and Roofing Tin Plates—best for both roofer and property owner. Sold by leading metal merchants, and used by leading roofers and contractors.

American Sheet and Tin Plate Company

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Legal Department

OUR views on the following stated case are asked by an Illinois general contractor:

When Contractor Is Delayed in Performing Contract

He entered into a contract to erect a bank building; the agreement being written on standard form No. 4, as adopted by the Illinois Society of Architects. One clause provides for perfect completion of the work, ready for occupancy on or before October 15, 1921, provided that the contractor be given possession of the premises on or before July 15, 1921, and subject to extensions in accordance with Article VII of the contract. $10 a day for each day's delay in completion was agreed on as liquidated damages for any delay.

Article VII provides that should the contractor be obstructed or delayed in the prosecution or completion of the work by the owner or the architect, etc., the time for completion should be extended for a period equivalent to the duration of the delays; on condition, however, that claim in writing be presented in writing to the architect within 24 hours of the occurrence of the delay, and that the duration of the delay be certified to by the architect.

Article VIII binds the owner to provide all labor and materials not included in the contract, in such manner as not to delay progress of the work, and to reimburse the contractor for any loss resulting from breach of this condition. Reciprocal provision appears for reimbursing the owner for any loss caused to the owner by the contractor's delaying material progress of the work. It is also provided in this clause that the architect shall fix the amount of damage payable to either party thereunder.

Article IX makes the architect's decision on any dispute binding on the parties, excepting as to certain matters which do not appear to be here involved, as to which provision is made for arbitration.

Article II provides for furnishing supplementary drawings and explanations necessary to illustrate the work to be done.

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age and The Builders' Journal, 920 Broadway, New York City.

The building was occupied by the owner-bank, February 8, 1922; the contractor having been delayed 117 days in waiting on plans, details, and other workmen employed by the owner. The architect was notified in writing of the delays and the reasons for the delays.

The architect states that he will not extend the time for finishing the building, and that the contractor is expected to make good the damages resulting from the delay in completing the work.

"My opinion," says the contractor, "is that the owner and the architect are liable to me for the damages for the following reasons:

1. They failed to give size of opening for vault-door until October 15, the day the building was to be completed.

2. The architect changed positions of the windows by revised floor plan, which change made it necessary for the contractor for cut stone to get out more stone of other dimensions to fill the places where the windows were changed. This revised floor plan was made and dated October 15.

3. They delayed the work of plastering 21 days, on account of the architect not having completed the details on ornamental work.

4. The owners caused a delay of 38 days in setting the vault door, fixtures, etc., and in doing work on the floors.

To the extent that completion of the work was delayed by the owner and the architect, and their own independent employees, we are of the opinion that the contractor is exonerated from liability for the agreed daily damages agreed on, and is, on the contrary, entitled to reimbursement for damages sustained by him in consequence. This assumes that proper notice of delays was given, and that the delays by the owner in giving vault opening dimensions, etc., were the direct cause of delays in completing the building. No personal liability against the architect appears, in our judgment.

From a practical standpoint, the only thing that this contractor can do is to place his interests in the hands of some dependable local attorney, and let him fight the thing out, if the owner refuses to make a satisfactory adjustment. As throwing some light on various angles of the subject, we summarize below some well-established rules of law:

A contractor is entitled to credit for time during which performance of his agreement has been excusably delayed by fault of the owner, the architect or a co-contractor employed by the owner to do independent work. The courts have implied such conditions in cases where no express provision covering the point has appeared in contracts. And in an Illinois case (187 Ill. App. 426) it was decided that delays caused by requiring extra work are to be allowed in favor of the builder.

But the courts have recognized the validity of clauses requiring, as in this case, the contractor to give notice of delays caused to him, and have denied credits for delays where such clause has not been complied with by the contractor and not waived by the owner.

And reasonable discretion is vested in the architect, under such a contract as that before us, to determine the duration of delays for which credit is to be allowed to the contractor. But such a

Fittingly Crowned with Copper

Architectural monuments in New York and elsewhere are roofed for the greatest permanence and economy.



Woolworth Building, New York Architect, Cass Gilbert, New York



L. C. Smith Building, Seattle, Wash., Architects, Gaggin & Gaggin, Syracuse, N. Y.

A PLEASING sight on thousands of buildings in New York, the old-green tone of Copper also is a satisfying part of the architectural vista in other cities.

For illustration of the use of Copper as a roofing material we have taken three tall buildings—the Woolworth, the highest building in the world, and the L. C. Smith Building at Seattle and the Magnolia Petroleum Building at Dallas, the tallest buildings outside of New York.

These buildings were of course erected with durability as the main thought.

Brass pipe is another repair-saving item where full consideration is given to lessening depreciation and upkeep.

"Copper and Brass are cheaper because you pay for them only ONCE"

"Copper Roofing," a manual for architects, is out in a second edition and will be mailed upon request.

COPPER & BRASS
RESEARCH ASSOCIATION

25 Broadway - New York



Magnolia Petroleum Building, Dallas, Tex Architect, Alfred C. Bossom, New York.

clause does not give the architect powers of a czar. For example, in the case of Murphy vs. Orne, 39 Atlantic Reporter, 959, the Pennsylvania Supreme Court decided that a clause in a contract before that court did not invest the architect, to the exclusion of the courts, with power to determine the questions, what delay there was in completing the work, and whether it was caused by acts or orders of the owner, or was attributable to the contractor, in which latter case, as here, the contract required a certain amount for each day of delay to be paid the owner as damages. The clause involved in that case provided, in effect, that changes might be directed by the owner and in case of any such addition, such further time should be allowed for completion of the work as the architect should deem reasonable. It was further provided that if any question should arise during the progress of the work, or in the settlement of accounts, it was to be referred to the architect, whose decision should be binding.

We give the following citations to cases where it has been decided by the appellate courts of Illinois that a builder is not chargeable with delays resulting from the owner's failure to do certain work required on his part and necessary to be done before the builder can do his work: 79 Ill., 181; 75 Ill., 540; 160 Ill., App., 554; 116 Ill., App., 159; 110 Ill., App., 510; 110. App., 200.

For cases on the proposition that ordinarily a builder is not liable for delays caused by being required to do extra work see the following Illinois cases: 227 Ill., 613; 85 Ill., 546; 160 Ill., App., 554; 57 Ill., App., 515.

"The owner is liable in damages to the builder, for a delay in performance on his part, or caused by some act of his or his representative, unless the particular provision of the contract relied on as a ground for recovery is intended to absolve the builder from liability for the delay, or unless the builder is himself the cause of the delay, or the owner stipulates against liability for delay caused by his agents. In case of a delay caused by the owner, the builder is not obliged to abandon the work and sue for damages, but he may proceed to complete the work and then claim damages. The owner is also, in the absence of any stipulation in the contract exempting him therefrom, liable for damages from delays caused by the failure of other contractors to perform work which they have undertaken to do for the owner, and which, as regards the former contractor, the owner is under obligation to do; but the owner may, by express stipulation in the contract, exempt himself from liability to one contractor for delays caused by other contractors." 9 Corpus Juris, 790-791.

Illinois cases will be found under the text above quoted.

Insofar as any of the questions in this controversy may be affected by provisions in the contract for arbitration, those provisions should be carefully examined by the contractor's counsel in the light of recent statutes and decisions in Illinois relating to agreements to arbitrate. Those statutes and decisions favor the validity of agreements to arbitrate disputes.

Third Parties' Rights Against Owner on the Contractor's Defaulting

WE are asked to discuss the legal rights of an owner under the following stated circumstances: A contractor for the erection of a house sublet the plumbing and masonwork. The second payment due him was promptly paid, but, instead of paying his carpenters and the subcontractors, the contractor went on a spree and practically abandoned the job. The carpenters, subcontractors and a lumber dealer, who furnished materials for the work, demanded payment from the owner; the contractor having agreed to pay them on receiving the second payment from the owner. The owner has assumed charge of the work, completing it by day's work and through small contracts. The lumber dealer removed various materials from the site, which he had furnished for the job, but which had not yet been used. These had practically been paid for by the owner, through an overpayment to the contractor on the faith of his expressed intention to pay the third party claimants. Carpenters have filed liens for their work.

What position is the owner in? Is he liable to the contractor's workmen? Has the plumber a valid claim against him? Had the material man any right to remove the material? Has the mason subcontractor any claim against the owner for work or material? All of these men received payments on account when the first payment was made. The contractor is financially irresponsible and makes no effort to straighten out matters.

Since no one of these third persons appear to have any sort of agreement direct with the owner, having furnished their work and materials as subcontractors or employees or materialmen of the contractor, the owner is not personally liable on any of their claims. If they have any right, as to the owner, it is to enforce liens against the property.

Assuming that this is a New York transaction, that the contractor has been paid all that will be due him under the contract, and that no notice of lien was given before payments were made by the owner to the contractor, we are of the opinion that no valid lien claims can be enforced.

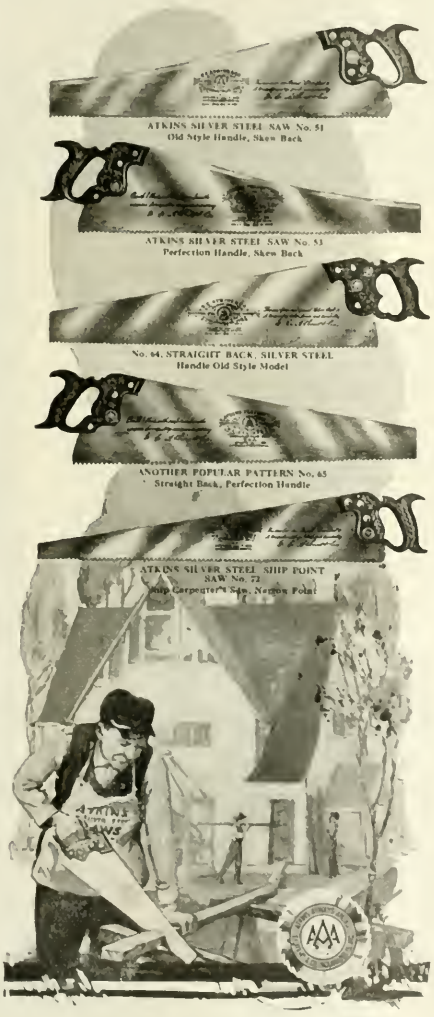
The New York Lien Law (sec. 4) provides that "if labor is performed for, or materials furnished to, a contractor or subcontractor for an improvement, the lien shall not be for a sum greater than *the sum earned and unpaid on the contract at the time of filing the notice of lien, and any sum subsequently earned thereon.* In no case shall the owner be liable to pay by reason of all liens . . . a sum greater than the value or agreed price of the labor and materials remaining unpaid, at the time of filing notices of such liens, except as hereinafter provided."

Interpreting this section, the courts of New York have decided: The object of the law is to reach in the hands of the owner *any balance owing by him to the contractor.* If nothing remains due the contractor when lien notices are filed the liens are unenforceable. An owner cannot be compelled to pay any greater sum for the completion of the work than he has agreed to pay, where payments have been made to the contractor in good faith and before filing of lien claims. Where the contractor defaults and the owner completes the job, the lien of a laborer or subcontractor or materialman attaches only to the difference between the cost of completing the building and the amount of the contract price unpaid when the lien is filed. In these respects it will be noted that the New York law differs from that in force in many other states where the effect of the mechanics' lien statutes is to entitle subcontractors to liens filed within stated times, regardless of payments which may have been made to the contractor by the owner. It is held by the New York court that, under section 7 of the Lien Law, it is only when an owner makes payments under a contract before they are due, and then for the purpose of defeating the lien rights of subcontractors, etc., that the liens may be enforced against him, when not filed before such payments were made.

It seems that the lumber dealer, having delivered materials on the site for use in the building, had no right to reclaim them merely because his chances of recovering their price against the contractor, to whom they were sold, failed. However, it seems that title to the materials remained in the contractor, because they had not been incorporated into the building; and if the contractor obtained possession of them on fraudulent misrepresentations concerning his financial condition the dealer was entitled to reclaim them. We do not believe that the owner had acquired such right to the materials as gives him a right against the dealer, unless by reason of agreement between him and the contractor it was understood that title to all materials brought by the contractor on the job should vest in him. If there was such understanding, however, and if the dealer sold the materials on open credit, we do not believe that the dealer had a right to repossess himself of the materials, and the owner would have a valid claim against him for their value.

This is a case where the owner was unfortunate enough to select an irresponsible contractor who made a low bid with the idea of obtaining as much as possible before quitting.

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SILVER STEEL SAWS



Hand, Rip and Panel Saws
Straight or Skew Back
Wide or Ship Point

Improved Perfection
or Old-Style Handles

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Branches Carrying Complete Stocks In The Following Cities:

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Chicago	Portland, Ore.	Sydney, N. S.W.
Minneapolis	San Francisco	Vancouver, B.C.

Review of the Building Situation

BUILDING statistics for July just published by F. W. Dodge & Co. show that the volume of contracts awarded is about 2 per cent. increase over that of June and about 65 per cent. increase over that of July, 1921.

It is greater than any previous monthly total, excepting that of April and May of this year.

There was a considerable increase in the amount of contracts awarded in the Middle West district, which shows that the building revival has hit our Middle West States, but unfortunately it is not up to the average maintained by the Eastern States for the past seven months of this year.

The July figures bring the total of the seven months of the year up to the immense sum of $2,041,-065,000! The total is 60 per cent. greater than that for the corresponding period of 1921, which surely indicates that 1922 has been the biggest year the building industry has enjoyed.

It is sincerely to be hoped that there will be no lasting bad effects from the coal or railroad strikes.

Although residential construction still maintains the lead there is a decline in this class of construction over that of the June figures. There was a considerable increase in industrial and public works construction, the figures for industrial plants totaling $31,882,-500, which is 9 per cent. of the month's total, and the largest for this class of construction since November, 1920.

In residential construction the New England district showed a slight increase, as did the Pittsburgh district. There was a noticeable decrease in those States in which the coal strikes were in progress and no doubt the spirit of industrial unrest held back a great many building projects.

A good sign of the times is that an immense amount of money is being spent for schools in all districts. While, of course, there has been some lessening of the amount of money spent on this class of construction over that of June, still the total amounts to the immense sum of $40,690,200.

In looking at the figures for contemplated projects, we certainly see a most healthy outlook. That the great bulk of the buildings are needed in the East is revealed by these figures. A surprisingly large amount of residential construction is still required.

Record of July, 1922, Building Contracts Awarded

Classifications of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$3,537,200	$12,017,100	$10,480,100	$7,075,100	$9,206,700	$1,703,700	$44,019,900
Educational	2,377,200	9,890,600	6,425,600	7,306,700	12,861,500	1,828,600	40,690,200
Hospitals and Institutions	1,099,000	2,859,800	1,269,000	570,300	4,931,000	295,000	11,024,100
Industrial	963,000	2,811,000	2,698,500	7,011,000	17,806,000	593,000	31,882,500
Military and Naval	45,000	8,000	5,000	.....	190,000	.....	248,000
Public Buildings	68,700	566,200	381,400	317,000	12,477,300	26,500	13,837,100
Public Works and Utilities	2,535,200	13,245,000	15,997,200	16,698,700	29,597,500	1,088,000	79,161,600
Religious and Memorial	714,000	1,091,000	1,698,500	2,316,500	4,055,400	210,000	10,085,400
Residential	13,109,200	33,389,000	15,216,500	17,045,100	28,152,800	2,038,500	108,951,100
Social and Recreational	1,455,700	608,000	842,800	1,672,400	5,377,000	225,000	10,180,900
Total	$25,904,200	$76,485,700	$55,014,600	$60,012,800	$124,655,200	$8,008,300	$350,080,800

Building Projects Contemplated, July 1922

Classifications of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$4,419,300	$16,231,900	$14,300,300	$4,758,000	$16,703,700	$3,784,200	$60,197,400
Educational	3,292,000	4,903,300	6,189,900	3,229,600	4,755,200	860,600	23,230,600
Hospitals and Institutions	559,000	4,013,000	649,000	289,500	973,000	1,605,000	8,088,500
Industrial	1,459,000	68,676,200	10,597,000	3,371,500	10,708,200	687,000	95,498,900
Military and Naval	45,000	33,000	221,000	.....	273,000	30,000	602,000
Public Buildings	428,000	799,400	223,200	225,000	1,938,000	185,000	3,798,600
Public Works and Utilities	3,169,800	9,106,000	24,810,000	39,193,500	76,205,100	3,058,500	155,542,900
Religious and Memorial	913,500	2,191,000	1,424,000	818,000	2,541,000	615,000	8,502,500
Residential	14,371,100	41,868,500	31,329,600	15,821,700	34,371,900	2,659,500	140,422,300
Social and Recreational	1,259,500	2,887,000	1,660,500	1,136,800	5,250,000	145,000	12,338,800
Total	$29,916,200	$150,709,300	$91,404,500	$68,843,600	$153,719,100	$13,629,800	$508,222,500



NORTH SIDE HOTEL, EVANSTON, ILL. (Suburb of Chicago)
Robert G. De Golyer, Architect — Equipped with Type AP Bisk Kitchenette

BUILT-IN STEEL KITCHENS

were used in this apartment hotel, permitting the most economical use of space obtainable, accompanied by maximum beauty in appearance of the room.

Bisk steel kitchenettes come in all styles and combinations of units, adaptable to every size and location of space available.

The units are built on the idea of sectional book case, permitting the use of few or many units as desired.

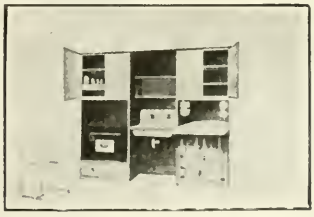
For instance, our assembled stock cabinet AB-1 Ventilated, recommended for general use, is equipped as follows:

1. Two steel cabinets 18 inches deep, 30 inches wide, and 82 inches high. One containing a three-burner gas range with broiler burner in large oven. The other housing a substantial refrigerator with 50 pounds ice capacity, and large food compartments.
2. Standard sink and special drain shelves over it.
3. Polished nickel zinc covered sliding work table over the refrigerator.
4. Glass jars for coffee, tea, salt and pepper, as well as large swinging bins for flour and sugar.
5. A cutlery drawer in each cupboard section, and a large pan drawer under the stove.



Contractors and Builders

If our stock units are not adaptable to your space, submit your problems with necessary details and measurements, and our Service Department will gladly furnish expert recommendations. Better still, if you sent blueprints of floor plan.



Bisk sectional kitchen cabinets are made entirely of auto body steel electrically welded and finished in sanitary white enamel baked on. No bolts or screws used.

All units are air-tight, vermin-proof and dust-proof.

BISK

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	July 27	Aug. 28
LONG LEAF YELLOW PINE—		
B. and Better Edge Grain Flooring, 13/16x2½" Face...	$80.00	$80.00
Dimensions, SISIE, No. 1 Common, 2x4", 10'.....	39.75	37.00
Timbers, Merchantable, '05, 12x12", 10 to 20'.....	53.00	53.00
B. and Better Ceiling, ½x3¼.....	45.50	46.50
B. and Better Partition, ¾"x3¼".....	59.00	60.00
B. and Better Finish, 1x4".....	64.00	64.00
No. 1 Common Boards, 1x8".....	44.00	44.00
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13/16x2½".....	$67.00	$65.00
Roofers, 13/16x5½"	31.50	31.50
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3".....	$75.00	$75.00
No. 1 Clear V. G. Flooring, 1x4".....	73.00	73.00
No. 2 Clear and Better Ceiling, ¾x4".....	45.00	48.00
No. 2 Clear and Better Novelty Siding, 1x6".....	52.75	52.75
No. 2 Clear and Better V. G. Stepping.....	89.00	89.00
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M.....	$7.40	$7.68
Washington Perfection Shingles, per M.....	7.18	7.42
Clear Bevel Siding, ½x6".....	43.50	52.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½".....	$8.55	$8.68
Dimension, 2x4", 10 to 16'.....	32.50	34.00
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2x2¼".....	$157.50	$157.50
Clear Plain White Oak, 13/16x2¼".....	113.50	113.50
Clear Plain Red Oak, 13/16x2¼".....	113.50	113.50
Clear Maple, 13/16x2¼".....	103.00	103.00
(All lumber prices furnished by National Lumber Merchant)		
COMMON BRICK—		
Per M. f. o. b. job.....	$25.00	$24.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered.....	$2.45	$2.45
STRUCTURAL STEEL (IRON AGE)—		
Per 100 lb. to large buyers.....	$2.09	$2.24
CRUSHED STONE (cu. yd.)—		
¾ in.	$2.70	$2.75
1½ in.	2.55	2.60
WALL BOARD—		
Per 1,000 sq. ft. in lots under 1,000 sq. ft.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.....	45.00	45.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered.....	$18.00	$18.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered.	20.00	20.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	22.00	22.00
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag.....	$0.60	$0.60
Masons, per 50 lb. bag.....	.49	.49
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.50	$1.55
¾ in. Gravel (per cubic yard).....	2.75	2.75
1½ in. Gravel (per cubic yard).....	2.75	2.75
FACE BRICK—		
Tapestry (delivered)	$46.00	$46.00
Caledonian (delivered).....	41.50	43.00
Smooth Grey (delivered).....	44.50	47.00
Fink Buff f. o. b. factory.....	36.00	36.00
SHINGLES—		
Asphalt, Single (per square).....	$8.50	$8.25
Asphalt, Strip (per square).....	6.75	6.50
STAINED WOOD SHINGLES—		
16 in. Extra Clear (per square, delivered).....	$11.00	$11.00
18 in. Eureka (per square, delivered).....	11.00	11.00
18 in. Perfection (per square, delivered).....	12.00	12.00
24 in. Royal (per square, delivered).....	12.25	12.25
24 in. Imperial (per square, delivered).....	12.50	12.50
VITRIFIED SEWER PIPE—		
4 in. (cents per foot).....	$0.11½	$0.11½
6 in. (cents per foot).....	.16¼	.17¼
SLATE ROOFING—		
Bangor or Slatington, 8x16 in. (per sq. at quarry)...	$8.40	$8.40
CORNER BEADS (Galvanized)—		
Per Foot	$0.02½	$0.03½
WALL TIES (Galvanized)—		
Per Thousand	$5.00	$5.00
FLUE LINING—		
8¼ x 8¼ in. Per Foot.....	$0.33	$0.33
8¼ x 13 in., Per Foot.....	.50	.50
HOLLOW TILE—		
8 x 12 x 12 in., heavy. Each, delivered.....	$0.22¼	$0.22¼
HAIR—		
Per Bushel	$0.60	$0.60
PLASTER BOARD—		
32 x 36 x ¾ in., Each.....	$0.22	$0.22
MAGNESITE STUCCO—		
Per Ton	$70.00	$76.00
TILE—		
1 in. Square or Hexagon, White, per sq. ft.....	$0.25	$0.25
3 x 6 in. White Wall.....	.60	.60
8 x 8 in. Red Floor.....	.45	.45

CHICAGO PRICES

	July 27	Aug. 28
YELLOW PINE—		
Boards, 1x8, No. 1 Com.....	$39.00	$44.00
Casing and Base, 6-8 in.....	65.00	65.00
Ceiling, ¾x4, B. and Btr.....	44.00	48.00
Dimension No. 1, 2x4, 12 to 14 ft.....	34.00	40.00
Drop Siding, 1x6, B. and Btr.....	47.75	52.00
Finish, 1x4, B. and Btr.....	62.00	62.00
Flooring, B. and Btr. E. G., 1x3.....	74.00	78.00
Lath, 4 ft., No. 1.....	7.20	7.75
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	44.00	46.00
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear.....	$94.75	$99.75
Oak Flooring, ¾x2, Cl. Pl., White.....	73.50	74.00
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear.....	$42.25	$42.25
Finish, S2S or S4S, 1x6 to 8 in. clear.....	91.50	91.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear.....	$43.00	$53.00
Shingles, Extra Clears, 16 in.....	5.04	5.87
COMMON BRICK—		
Per M. f. o. b. job.....	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.05	$2.05
STRUCTURAL STEEL—		
Per 100 lbs. to large buyers.....	$2.09	$2.24
CRUSHED STONE (cu. yd.)—		
¾ in.	$3.00	$3.00
1½ in.	3.00	3.00
WALL BOARD—		
Per 1,000 sq. ft. in lots under M.....	$45.00	$45.00
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	50.00	50.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$3.00	$3.00
¾ in. Gravel (per cubic yard).....	3.00	3.00
1½ in. Gravel (per cubic yard).....	3.00	3.00

ST. LOUIS PRICES

YELLOW PINE—		
Boards, No. 1 Com., 1x4.....	$37.00	$37.50
Partition, ¾x3¼, B. and Btr.....	55.25	56.00
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	34.50	36.00
Finish, S2S, B. and Btr., 1x4, 6 & 8 ft.....	60.00	63.00
Flooring, B. and Btr., E. G., 1x3.....	74.00	76.00
Flooring, B. and Btr., F, G,. 1x3.....	59.00	61.00
Lath, 4 ft., No. 1.....	6.00	6.88
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	43.00	43.00
CALIFORNIA REDWOOD—		
Finish, S2S, Cl., 1x6 in.....	$91.50	$91.50
Siding, 4 in. Bevel, 10 to 20 ft.....	44.00	44.00
8 inch Colonial	70.75	70.75
8 inch Bungalow.....	70.75	70.75
HARDWOODS—		
Oak Flooring, ¾x1½ and 2 in., Clear Qtr. White.....	$106.50	$106.50
Maple Flooring, 13/16x2¼ in., Clear.....	91.00	91.00
RED CEDAR—		
Siding, ½x6, Clear	$41.00	$46.00
Shingles, Clears, Per M.....	4.96	5.61
COMMON BRICK—		
Per M., f. o. b. job.....	17.00	$17.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.10	$2.10
STRUCTURAL STEEL—		
Per 100 pounds to large buyers.....	$2.18	$2.33
CRUSHED STONE (cu. yd.)		
¾ in.	$1.83	$1.83
1½ in.	1.83	1.83
WALL BOARD—		
Per 1,000 sq. ft. in lots under M.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	45.00	45.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.10	$1.10
¾ in. Gravel (per cubic yard).....	1.30	1.30
1½ in. Gravel (per cubic yard).....	1.25	1.25

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"Lock" Expanded Metal
"Truss - V - Rib" Re-enforcement
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—Truss-Wing
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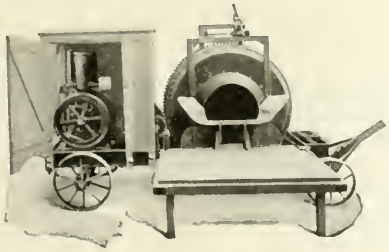
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Subscriber to Building Age..... September, '22

News, Notes and Comment

Jumbled Cities

AVOIDANCE and correction of the present topsy-turvy arrangement of so many American cities, the cause of millions of dollars' loss, is the object of "A Zoning Primer" issued by the Division of Building and Housing of the Department of Commerce, according to an official announcement recently made.

The enormous waste in American cities from scrapping good buildings on account of the blighting of districts has long been apparent, and for years has levied its tax on the American people.

Random crowding of stores among private dwellings, the elbowing of factories and noisy smelly garages into the rightful domains of neat retail stores or well-kept apartment houses, and the construction of tall, bulky office buildings so closely crowded that the lower floors are too dark for human use and consequently seldom occupied, is part of the present stupid, wasteful jumble which proper zoning will prevent and gradually correct, in the opinion of the Advisory Committee on Zoning of the Department of Commerce.

The pamphlet describes the object of zoning, the need, the health and property protection afforded, and its effect on the cost of living. Legal problems, with an outline of what some cities have accomplished, and a zoning program are also included among other subjects. Copies are sold by the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents each.

Novel Building System

IN recent issues we have published descriptions of the Building project of the Metropolitan Life Insurance Co. The contracts for the $6,500,000 worth of apartment houses have been let and work is already under way.

Something new in the method of assembling these fifty buildings in four block groups will be worked out under the guidance of Robert Glenn, construction superintendent under the general contract, which the company made with Henry C. Irons & Sons. It will be a checkerboard system, leaving a vacancy between each house above the grade floor, which vacancies will be utilized as work floors for the houses to be finished on either side.

Mr. Glenn, who devised the system, is confident that it will result in a considerable advantage and ultimate saving, as it will afford space for the storage and, incidentally, minimize the handling and preparation of the materials.

Potential Reconstruction Markets

AN estate in an eastern city had to spend 30 per cent of 1921 income from $300,000 worth of homes on repairs because proper maintenance had been neglected for three years. If such work had been budgeted each year from one-third to a half of the total expense could have been saved.

Government Whitewash

MANY requests reach the College of Agriculture at the Ohio State University for the recipe of Government Whitewash, one that is whiter than most such mixtures, that spreads so evenly that a pint covers nearly a square yard, and that lasts well when used on outside jobs. This is the standard recipe: Slake one-half bushel of fresh lime with boiling water, covering the receptacle to keep in the steam. Strain the liquid through a fine sieve, and add 7 pounds of fine salt, previously dissolved in warm water; 3 pounds of ground rice, boiled to a thin paste and stirred in; 1 pound of white glue, soaked first in cold water until swollen, then carefully melted over fire. To this mixture add five gallons of hot water and let it stand covered for a few days before using.

Book Notices

Materials of Construction, by H. E. Pulver; 318 pages, 6 x 9; 110 illustrations; price $3.00. Published by McGraw-Hill Book Co., New York City.

This book has been designed as an elementary text book on the types, manufactures, properties and uses of building materials. While it was especially prepared as a text book for the University of Wisconsin, in which the author is a professor, it contains enough practical pointers to make it of general interest to any earnest student of building construction.

* * *

New Building Estimators' Hand Book, by William Arthur; new revised edition; 1,000 pages; gilt edge; price $6.00. Published by U. P. C. Book Co., New York.

But little need be said about this valuable hand book as it has been before the building fraternity for many years. In the present edition much new information has been added and revisions made so as to bring the text up to date. All matter has been entirely reset, so that the book is really new from cover to cover.

Information is given on the measurements, erection and cost of all the different forms of work met in constructing modern buildings. Needless to say, this new edition forms such a valuable aid to the contractor that it is money lost not to have a copy.

* * *

Practical Accounting for General Contractors, by H. D. Grant; 254 pages; price $3.00. Published by McGraw-Hill Book Co., New York City.

The proper keeping of accounts is of vital importance to the contractor and in this book the author gives some practical hints on the subject that will be a help to every contractor who puts them into practice. The author had charge of the accounting department in a large contracting firm and therefore has been able to embody in his book some very practical first-hand information.

BUILDING AGE

AND

THE BUILDERS' JOURNAL

NEW YORK, OCTOBER, 1922



The Garden Wall as Part *of* the House

IN certain parts of Europe the traveler is surprised to find that many of the houses and gardens are secluded from view by high walls. Sometimes an opening with a grilled gate gives the passerby a glimpse of the homestead within. In other cases, a solid wood or metal door is used, assuring the occupants of the house the utmost privacy.

In America, however, the tendency has been to have one's house stand in the open and bid a welcome to all. Sometimes to frame in the garden, a fence or wall has been constructed around some portions of the plot.

There has been a tendency of late years to combine the



old European garden wall idea with that of the American plan house, and the result has been a combination of house with attached garden wall which together form a better looking picture than when each is left standing alone.

To the occupants of the house, it gives privacy for certain parts of the garden making this portion really an out-door living room, while the house itself still retains its welcome appearance.

An arrangement of garden wall and house is very practical in taking care of a hilly site as there is a chance of effectively handling the terraces so that they form

pictures rather than disfigurements. In the few illustrations shown here, a few suggestions are offered of what may be accomplished by careful planning.



The first illustration shows a brick house covered with stucco and the garden wall is made of the same material. The coping on top is a layer of brick on edge, and here and there some face brick appears as quoins which add a dash of color to the stucco walls. The garden wall here is in line with and forms a continuation of the front of the house which is set back a fair distance from the road. A handsome garden is planted in the front that in no way makes the house look prison-like, while the occupants can enjoy the outside and still have privacy. This interesting home is located at Larchmont, N. Y.

The next illustration shows a rather careful handling of a hollow tile house and wall. Here the wall is combined with a gate with a hooded top. The wall does not extend very high, but on top is a wood rail which is finished in natural cypress, stained brown. Such a treatment with the stucco work gives rather an interesting appearance when viewed in combination with the green of vines and shrubs. This little detail was designed by Patterson & Dula, architects, of New York, and the house is located at Hartsdale, N. Y., being built for Frederick I. Kent.

The reason more of this kind of better building has not been done is simply because it has not been brought to the attention of home owners.

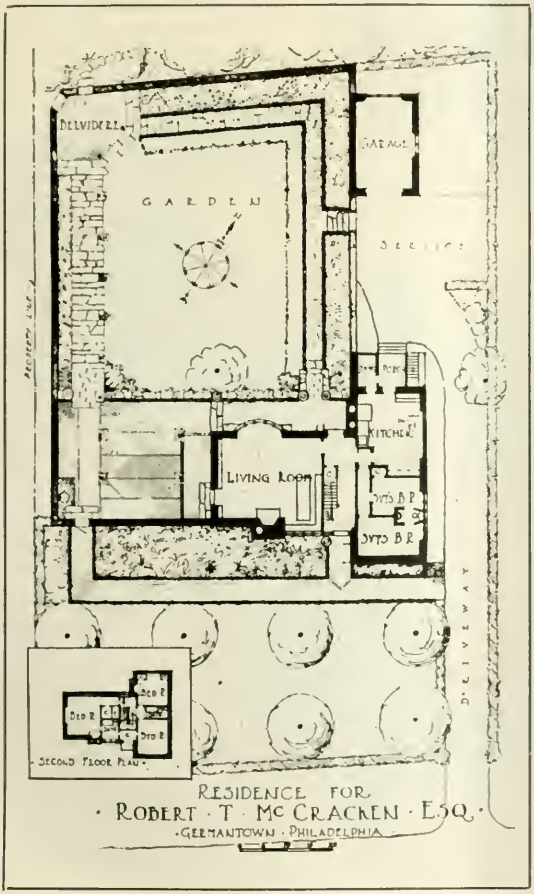
The third picture shows quite an interesting treatment of a rubble stone house and wall. This is a little detail conceived and sketched by Mr. Ernest Flagg, architect, of New York. It shows the possibilities of combining beauty and utility with a house set directly on a road.

The fourth picture shows a very interesting example of a wood garden wall. The lower portion of this wall is shingled the same as the house and the upper portion is of square bars with a rail on top. This house is set back from the road a little distance and an ornamental gate gives access to the inner enclosed garden with its simple pergola, giving the occupants the privacy of an outdoor living room and still not disfiguring the house or landscape, but rather enhancing the beauty of all. This house was built at Larchmount, N. Y., for Mr. J. E. Sample, from plans prepared by Chester A. Patterson, architect, of New York.

Builders are many times called upon to build a fence around a house and the appearance of many a place is marred by some sort of an ugly contraption serving as a fence. Even on a very small plot of land, it will be well to extend certain portions of the house so as to include a little well designed fence or gate to fill out the lot width rather than spoil the appearance of the front with something that has no merit.







Charming Stone Home Design

MELLOR, MEIGS & HOWE
Architects

IN locations where stone can be had, it forms a very good material for home construction, but it must be handled with a master hand to produce an artistic result.

In the house pictured here a charming result has been obtained by having an appropriate design. It is something that suits the location. Little bits of color have been introduced by the use of brick for sills and top of the chimneys. The grouping of the windows is worthy of particular note; all these windows are of the casement type, which is now becoming so very popular.

The stone work has been laid up in random rubble, with the mortar joints in white, and the roof is of slate of different shades, so as to give a handsome blended effect.

A stone wall forms an attractive part of the entire scheme and this extends from the front of the house down one side across the back and joining with the garage, thus forming a complete enclosure for the garden and, besides, serves as an admirable background for the different shrubs and plants.

Advantage was taken of the natural slope of the land to introduce terraces and steps at different points, while some portions are covered with pergolas.



NEW HOMES MODERN

is wholly lacking in style; in fact, we now-a-days would term it an ugly looking building.

The exterior of this building has been overcoated with stucco. The second floor and gable ends have been treated with English half timber work in a neat and pleasing arrangement. The hipped gables of the main roof and

FRATERNITY HOUSE
Dartmouth College

LARSON & WELLS
Architects



FANCIFUL as the tale of "Aladdin and His Wonderful Lamp" may be, it has its counterpart today in the modern remodelling of buildings. Aladdin's cry of "New lamps for old" can be paraphrased to the builder's cry "New homes for old." With the old house at one's command, the Genie of design and skill will produce wonderful effects for its master.

Looking quickly at the upper illustration on this page, one would never think that it is the same building as the lower illustration, still it takes only a little comparison to prove that it is. Truly, a remarkable transformation has taken place with this building. It is certainly a new home for an old one.

The old building pictured here is a good example of the well constructed house of about fifty or sixty years ago. Sound timbers and good workmanship produced a substantial building that will last for many more years. To our modern ideas of taste, however, it

FOR OLD By ALADDINS

dormers have been changed to plain gables and the fancy scalloped verge board has been eliminated and a plain rafter substituted. The fancy chimney tops have been removed to the great improvement of the entire design.

The "stoop" has been replaced by a good, wide porch with balcony above. This porch is built of brick and concrete and a wood railing extends around the balcony. French doors replace the window and old front door on first floor. The square bay window has been retained, but the other sloping bay window attached to the wing has been removed, and a triple mullion window substituted. On the second and third floor double mullion windows have been substituted for the single windows in the front. The other windows remain with the exception that new



TURTLE BAY GARDENS
BOTTOMLEY & DEAN
Architects



divided sash has been substituted in place of the two light sash of the old home.

This building is the Sigma Phi Epsilon Fraternity house of Dartmouth College, Hanover, N. H. This remarkable remodelling job was the work of Messrs. Larson & Wells, architects, of Hanover, N. H. It is certainly a most interesting example and shows what can be accomplished by a modern Aladdin.

Every city abounds in a number of old fashioned private

dwellings that have more or less outlived their elegance. They belong to an older generation and they were in their day the best examples of comfortable homes. In East Forty-eighth street, New York, there was a row of such buildings and a corresponding row in the rear facing Forty-ninth street. These old residences were all purchased by a syndicate and Messrs. Bottomley & Dean, architects, of New York, were commissioned to prepare the designs and look after the remodeling work.



The entire development is called "Turtle Bay Gardens," which name was taken from the old designation of the water front of the East River in that locality. The street view of this development shows, on both sides, the type of the old brown stone houses that were remodelled. The high stoops of all the remodelled houses were removed—one still shows in our picture as this was taken just before this was removed.

The old fashioned cornices were removed and something more in a conformity with Italian architecture used instead. Casement windows have been substituted in all cases for the double windows that appeared in the old house. Little flower boxes and ornamental balconies, together with the iron railing and front, besides painting the old brown stone, has changed the entire appearance of the street front of this row of old fashioned houses.

The back yards of these old-time mansions really were a rather ugly group. Each lot was finished off with a wood fence about seven or eight feet high that was always kept carefully painted. There was usually an oblong central grass plot with a blue stone path all around it and a flower bed about two feet wide between the path and the fence.

The center lawn was ornamented at each corner with wash poles and usually on Monday mornings, the whole row would look like an animated laundry. This was the rear view that greeted the occupants of these wonderful homes, for truly they were wonderful, in that they represented the best that could be had at the time they were erected.

In the remodelling all the fences were removed and a large formal Italian garden laid out. The rear of the houses were slightly altered, different windows substituted, balconies added and then the planting that looked good as a whole and not only in individual spots. Low railings divided off portions of the yards, while high masonry walls marked the east and west ends of the development.

The very interesting construction work was undertaken by Thomas T. Hopper Co., building contractors, of New York.

SOMETIMES alteration jobs do not turn out well and as an example we show the remodelling of a small school house to a two-family house. Everything in this little alteration job was practical, but it lacks design.







Left Picture Shows Original School Building. Above Is How It Looks After Being Remodeled to a Two-Family House. Right—A Rear View of Remodeled House.

THERE are many good buildings that only need a little alteration to turn them into modern structures again. The field of remodelling is large and quite often shoring, etc., is needed; an article on this follows.

Shoring, Needling *and* Bracing

Their Uses and Application in Altering and Remodelling Buildings

By OWEN B MAGINNIS

SHORING for the practical purposes required by builders might be termed methods of temporarily supporting and sustaining any parts or portions of walls, floors, piers or other details of buildings already erected for alterations or changes thereon.

In this connection the remodelling of many buildings in towns and cities, their change of occupancy from dwellings into stores and places of business necessitate the employment of shoring, bracing and needling in their various phases; so that a knowledge of these methods of procedure should be possessed by every builder, especially those in communities where there are no firms or men who make a business of furnishing these necessary appliances.

To clearly explain the actual value of "shoring" let readers note the first photograph, Fig. 1. Here they perceive a series of shores or large timber uprights resting on heavy timber blocks called "sleepers" which carry on their top ends short lengths of steel "I" beams, singly for light 8 and 12-inch brick or stone walls and doubled, tripled or quadrupled for heavy 16, 24 and 36-inch heavy and high walls according to the weight which must be supported.

In this example there are six sets or series, safely supporting six piers which were pierced or cut through with drills and cold chisels with square holes under a straight course of brickwork at the level of the floor window sills.

These operations permitted the removal of the first story front wall and allowed the building of the new brick piers with bond stones to the right, left and in the middle and placing of the longitudinal steel girder which must in future fully, safely and permanently carry the upper walls, which it is shown doing in another remodelling job shown in Fig. 2.



Fig. 1—The Proper Shoring and Needling Needed in Converting Two Five-story Tenements Into Stores. Observe How the Steel Breast-runner Girder Is Placed to Carry the Four Upper Stories



Fig. 2—A Partly Remodeled Front Wall Changing Two Twenty-foot Dwellings Into One Store. Observe Original Form of Front to the Left of This Picture

Figs. 4, 5, 6 and 7 show several views of beams, needles and shores for heavy walls.

It may be well to state here that there is no fixed rule that can be laid down for this class of work, nor can any be given except that derived from personal practice and experience, as the nature of the work is so varied that it would be impossible to give any standard list or set of timbers, etc., necessary for the needs of the house shorer. His plant generally consists of all sorts and conditions of materials, ranging from a cold chisel to hoisting engines.

where the shoring has been removed. Note the holes wherein the needles were inserted and note again the working detail Fig. 3, which will convey the method employed in placing shores. For front walls the shores are slightly sloped or as technically expressed, "battered," in order to counteract any tendency of the walls to buckle or kick out. This may be observed in Figs. 1 and 4. In Fig. 4, we see also how a front wall may be supported by this method at the second or any of the upper stories or floors. If possible all shores, either those of the simplest such as simple spur or raking shores, ought to batter so as to push inward, thus resisting the tendency of walls to buckle or spring outward.

Generally speaking, it might be said that it requires all and every sort of timber listed, especially of the harder and heavier kinds, for bearing and carrying purposes, such as oak, yellow pine and spruce. These are the most reliable for long shores and needles, the spruce being most popular on account of its cheapness, toughness and lightness, although yellow pine is more adaptable for very heavy work, such as for brick or masonry structures, such as churches, halls, etc.

All timber must be of the very best quality, and second-hand building timbers have been found from experience to be most reliable, as years of exposure or use

have tried their qualities and guaranteed their capacities.

Regarding sizes and dimensions, I might state that for spruce they may run from 2x2-inch scantling to the largest sizes, yellow pine from 6 or 8x8 inches, also up to the largest sawn. All may be of lengths increasing in feet, sawn square and smooth. Out of wind or twisted timbers are useless not only by reason of their liability to fracture, but also by their loss of strength through warping or distortion.

In connection with the timbering come the wedges, which are even more reliable than pump screws. These powerful instruments are sawn out of the hardest and best seasoned oak, being 3 inches wide, 1½ inches thick at the butt and tapering to 1/4 inch. Two, as shown in the various pictures, are always used, and when placed as represented, they constitute the best means of tightening or raising walls, girders, beams, etc., known to scientific builders. The most careful shorers and movers prefer them to the screws, on account of

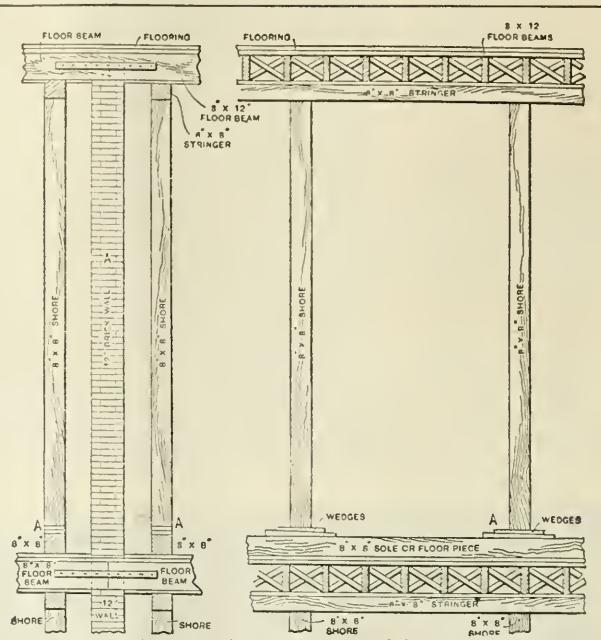


Fig. 3—Showing the Manner of Supporting Floors and the Use of Wooden Wedges



Fig. 4—Showing a Front Wall Shored and Needled at the Level of the Second Floor

security, but they are not always applicable to horizontal timbers in corners, or where it is not possible to deliver a blow, for it must be remembered that each wedge must be struck with equal force, or one will be forced past its fellow and the two rendered useless.

If the upright shores placed inside the walls do not reach down to the cellar or basement floor or to solid reliable ground, then the first tier of floor beams must have shores placed to support them as in Fig. 3 or blockings of heavy timbers may be built up from cellar floors or the floors may have ranging timbers placed under the beams and jack or pump screws screwed up tight to prevent any possible subsidence under the pressure of shores and weight above.

Gable or party walls may either be retained safe and unbuckable by raking shores, base plates, and wedges or if the site be small or narrow as shown in Fig. 7, where, as it was desired to keep site clear for building operations, the methods of "fly" shoring was adopted which simply consists in setting long timbers or "spreaders," as

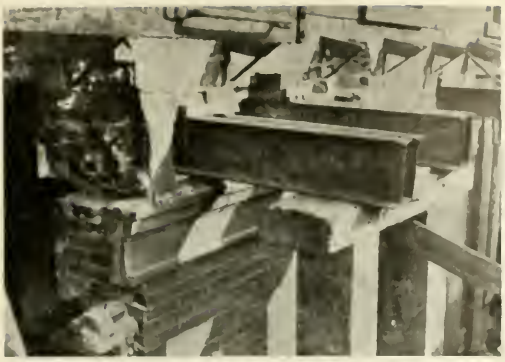


Fig. 5—Proper Arrangement of Shoring Timbers and Needles for Sustaining Heavy Piers by Coupling Them Together in Pairs

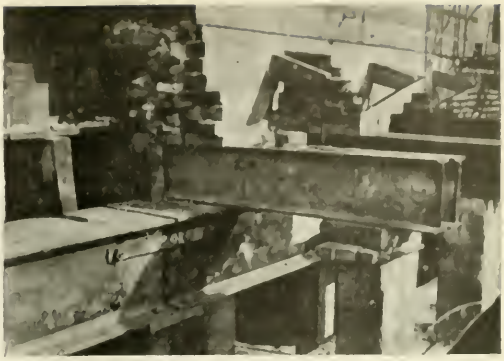


Fig. 6—Basement Wall Needled with Beams Set in Pairs. Steel Beams for Support of New Wall

they are technically termed, from wall to wall across the site, these ends thrusting against thick timber bolsters.

These shores are usually cut in tight without wedges and if made up in two lengths they are cleated or joined by side timbers which are well bolted and act as reinforcing pieces to stiffen each shore.

These "fliers," as some term them, are either placed from the floors of the old building as it is being demolished or else lowered or raised from the adjoining roofs and set by means of ropes or ladders.

They need not of necessity be set level, but must be so tight as to be immovable, made so by being hammered in place with heavy sledge hammers.

Where the distance between the walls is considerable, diagonal braces at each end will prevent the sagging of the spreaders.

Usually no timbers less than 8x8 inches are used for the spreaders and the timbers against the wall should not be less than 3x8 inches.

Where diagonal braces are necessary, these should be framed under the spreaders and spiked securely in place.

Flying shores are superior to raking shores because their thrust is immediately opposite the disturbing force.

Where one of the buildings is a good deal higher than the other, the flying shores are placed in an inclined position with a raking strut and braces securely spiked together so as to prevent sagging.

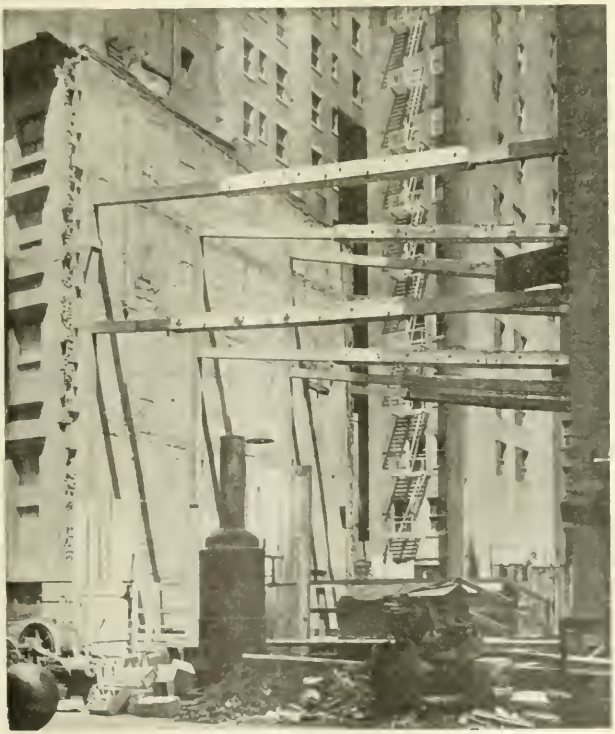


Fig. 7—Illustrating the Employment of Flying Shores or Spreaders

Each particular job will have certain details that will have to be worked out by the man on the job, no directions for meeting all sorts of conditions can be given, but the principles can be applied to all cases.

There is no part of alteration and remodeling work that calls for so much practical skill as the placing of proper shoring where certain portions of the walls are removed. In an early issue further details will be given of carrying out this very important building operation, also some hints on the removal of an entire building or part of it as is sometimes necessary on a remodeling job.



Creating Better Store Architecture

CLIFFORD C. WENDENHACK, Architect

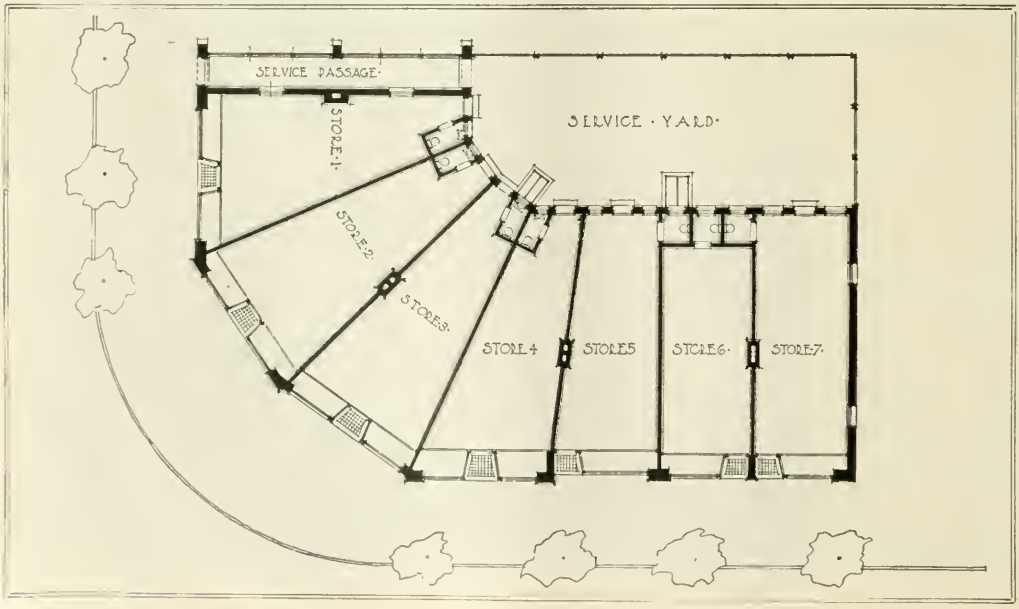
ONE of the blots of our domestic architecture is that of the almost universal ugliness of our store buildings.

An enterprising but unartistic gentleman thought it would be a good investment to develop a piece of property he owned at Montclair, N. J., with a row of stores, and his original plans called for the regular type of ugly construction.

As there are many fine houses in the neighborhood, the residents strenuously objected. Among these was Mr. Wendenhack, and he offered his services for the good of the community and produced a plan that would cost no more to erect than the contemplated ugly structure. The owner agreed to this proposition and the result is shown in the picture.

Here we have an artistic grouping of seven stores and one peculiar feature of the design is that technically there are five corner stores in the lot and more rent was secured for these stores.

The erection of these shops is an interesting example of what builders could accomplish if they would go after a client in the right way when he proposes to erect an ugly looking building—show him that something artistic can be erected for the same amount of money.



The Troublesome Problem *of* Extra Work How Conducted and How Paid For

By the Standardization Committee, K. H. PRATT, Chairman
General Contractors' Association of Cleveland

IT has been common experience that the matter of charges and credits for additions to or omissions from plans and specifications for a building project are apt to be a source of controversy between the contractor and owner. Unfortunately, it is very seldom the case that a building is put up without some alterations or modification of the plans, which involve a change in the contract price or the work, and there has been no standard practice in adjusting these differences, so far as we can determine. Therefore, your Committee has gone into the problem of trying to determine fair and equitable relations between contractor and owner where such changes are involved, and has formulated certain very definite recommendations.

Alterations or deviations from the original plans and specifications are a source of expense to the contractor, whether the change be in the nature of an omission or in the nature of an addition. All such changes are apt to interfere with the progress of the work, delay the completion of the work as a whole, cause the contractor additional expense on other work in progress on the job which is affected by the changes, and make demands not only on the contractor's field organization but upon his main office organization out of proportion to the amount of work involved. It is evident that there should be a charge to the owner for the services so rendered, regardless of whether the work is an addition or omission.

Recommendations

This leads to our first set of recommendations:

a. That all charges for additional work take into account the contractor's overhead in addition to the actual cost of the work and the contractor's profit.

b. That all omissions take the same items into account, and, to accomplish this end, we recommend that allowances for omissions be based upon the actual estimated cost of the work without any allowances for the contractor's estimated profit on the operation involved—it being our thought that such estimated profit should be retained by the contractor to compensate him for the additional expense involved in deviating from the original plans.

c. Accurate written records should be kept and all transactions relative to changes should be confirmed in writing between the contractor and owner.

Interpreting Plans and Specifications

Where work is considered by the contractor as additional to his contract price, such additional work may arise from a disagreement as to the interpretation of the plans and specifications, or it may be an addition to the plans acknowledged by the owner.

There work is considered by the contractor as additional to his contract price, such additional work may arise from a disagreement as to the interpretation of the plans and specifications, or it may be an addition to the plans acknowledged by the owner.

We recommend:

1. That all contractors prohibit their field organization from proceeding with any additional work to the contract, whether acknowledged or not by the owner, without specific instructions from the contractor's main office or his authorized representative.

2. Where the contractor proceeds with work in dispute as to whether or not it is extra, it should be a matter of written record from the contractor to the owner as to the contentions involved and as to the basis on which the work is being done.

3. Where there is no dispute involved, the work should only be done on the written authorization of the owner or his agent.

4. An accurate record of all labor and material used in connection with extra work should be kept on a separate extra work report sheet, with provision made thereon for the signature of the duly authorized agent of the owner directing the work to be done, and charged to the owner.

Lump Sum of Time and Material

Where work is performed additional to the contract, it may be handled in two ways. Either on a basis of an agreed lump sum charge or on a basis of time and material plus a percentage for contractor's profit.

We highly recommend that all work which can be intelligently priced and handled on a lump sum basis be so handled, and that the lump sum be agreed upon prior to the execution of the work, with proper acknowledgement of the work and amount involved.

Where it is impossible either through the nature of the work or the time element to definitely arrive at a lump sum price, we recommend that the work be performed on a time and material basis plus percentage for contractor's profit.

Charges for Extra Work

In the absence of any definite agreement in the contract, we recommend that charges for extra work performed on a time and material basis be billed to the owner in accordance with the following:

General Items of Cost

The general contractor shall be reimbursed in the manner hereinafter described for such of the actual expenditures in the performance of the work as are included in the following items:

a. Wages of workmen, material, supplies, tools and appliances (as distinguished from machinery and equipment listed hereinafter), and cartage and freight required for the completion of the work in question, either as shown by the revised plans and specifications, or by written instructions, and for the installing, equipping, operating and dismantling of temporary works, plant, machinery

and equipment, sheds, offices, commissary and hospital.

b. Sub-contracts placed by owner or general contractor for material or labor or both.

c. Rental, or its equivalent, beginning with shipment and concluding with arrival at return shipping point, at the rates set forth in attached schedule, for the general contractor's machinery and equipment, and rental actually paid by the contractor for other machinery and equipment, or parts thereof, as used in the prosecution of the work, cost of loading, unloading, shipping charges to and from the job, and ordinary repairs and replacements during use and shipment for all machinery and equipment. Rental on machinery and equipment in place at average rental and maintenance charge per schedule assigned by Associated General Contractors or general or main contract.

d. Premiums for bonds and fire insurance, fee of Building Trades Employers' Association, expenditures for telegraph and telephone service, expressage, postage, field office supplies, permits, deposits, royalties, and other similar items incidental to the execution of the contract.

e. Salaries of superintendents, foremen, engineers, timekeepers, clerks, expeditors, watchmen, waterboys, and all other employees in the field office of the general contractor to be pro-rated over the total number of workmen's hours daily and the proper proportion of the suerintendent's, timekeeper's, watchmen's, waterboy's, etc., time charged to each item of extra work. If any of these men are giving an overdue amount of their time to any or all items of extra work then their exact time given to the extra work is to be charged.

f. Slary allowances proportionate with time actually applied to this work for employees dividing their time between this and other work, transportation and incidental traveling charges to and from the work for the necessary field forces required in the economical and successful prosecution of the work in the procuring of labor, and in expediting production and transportation of material and equipment, and for other employees or officials of the general contractor actually incurred in connection with this work.

g. Compensation, public liability and contingent insurance on all wages and salaries. We recommend a charge of seven per cent of the payroll to cover these items, together with the uncovered risk.

h. An allowance to compensate the contractor for his overhead expense. We recommend a charge of 10 per cent on the total cost of work to the contractor to cover this item.

Credits to Owner

The owner shall receive from the general contractor the following credits:

1. Rebates to the amount of 50 per cent of the original billed price for all lumber and material used in this work and delivered in good and serviceable condition to and accepted by the general contractor.

2. Rebates to the amount of 50 per cent of the original billed price for all perishable tools and appliances used in the work and upon completion of the contract returned in good and serviceable condition to and accepted by the general contractor.

3. The full returned amount of any refundable deposit made and charged against this work.

To the sum of the items enumerated above, after proper credits have been given, a percentage is to be added for contractor's fee. We recommend a charge of 10 per cent to cover this item.

Payments for extra work should be made monthly on or before the tenth of the month following the month in which the extra work is performed. Extra work invoices should be paid in full, no percentage on same being retained by owner.

What About Our Future Lumber Supply?

OUT of 822 million acres of virgin forests in the United States there are 137 million acres left. This remainder is being cut at the rate of 5½ million acres yearly. In twenty-five years our supply of virgin timber will be exhausted. There is no way of adequately meeting the timber shortage that will then inflict hardships on the country. This hiatus will continue until new trees can be grown.

The New York State College of Forestry is cooperating in presenting these facts to the people. The public should demand the most sensible, early remedial measures. The impending wood famine should be mitigated as far as lies in the power of scientific forestry and public effort.

This movement for the relief of the forestry situation, just gaining headway, is at least twenty-five to forty years too late. In spite of everything we may do there will be a gap of 25 to 40 years between the period of exhaustion and the time when a new supply of timber can be grown in which this country will suffer severely from a scarcity of wood.

Gifford Pinchot, formerly forester of the United States, declares that there are no longer any inexhaustable supplies of forests anywhere. Each nation needs all its forests and more. Today the freight on lumber from coast to coast is boosting the price of lumber nearly 25 per cent., so it is easily seen that the cost of importing lumber from overseas would be almost prohibitive. The importance of the forestry question is second to none among our industrial problems in times of peace, but it would be vital to our safety in war.

The college urges a wide, comprehensive policy on the part of the state and nation in reforestation, forest protection and the utilization of the forests. Such a policy should become effective in 1922, and the people should get back of the movement without delay.

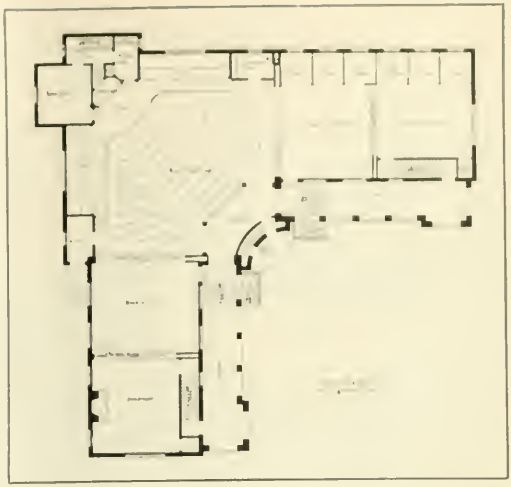
A shortage of wood will cause the adoption of other materials to take its place. Iron in different forms, clay products, cement, hard rubber, etc., will be used for framing, siding, and trim to a greater extent in future buildings.

Brick Church Design *of* Novel Plan

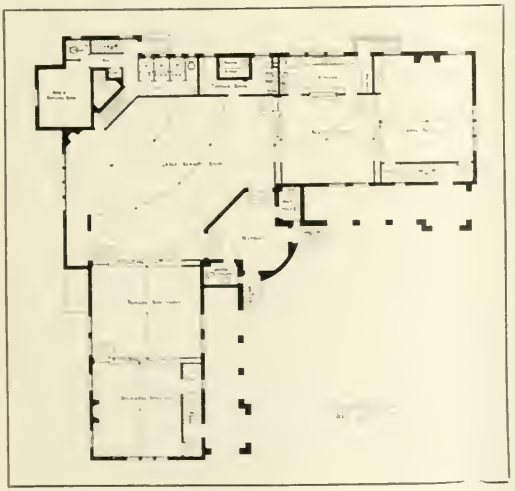
ROBERT H. ORR
Architect

ILLUSTRATED here is an exceptionally economically planned little church building of brick construction. It is designed, as will be observed, with two wings extending off from the main auditorium at right angles; and, as deserving especial notice, these wings are so arranged as to permit them being thrown immediately open to accommodate overflow attendance at the regular church services.

The seating capacity of the main auditorium is but 300, but these wings, together with the choir space, raise the capacity to about 750.







The rooms of the wings are provided with great telescoping doors and have stepped-up floors, thus enabling the pulpit to be seen from their farthest corners. In other words, practically the entire main floor may be converted into one great auditorium—yet the space may also be shut up into various departmental rooms.

On the main floor also are choir room, pastor's study, secretaries' room, and a number of small class rooms. There is a basement, nearly half above ground, under the entire building, and in it are located two banquet and social rooms, kitchen, ladies' parlor, primary department, and so forth.

The building is heated here by built-in gas radiators, on the unit plan. A furnace room, however, has been provided, and the usual furnace might have been substituted, if desired. A ventilation system is also installed. The building is located in Selma, California, and is the property of the Selma Christian Church. The present building cost is estimated at about $40,000, complete, except for furnishing.

The Genealogy *of a* House

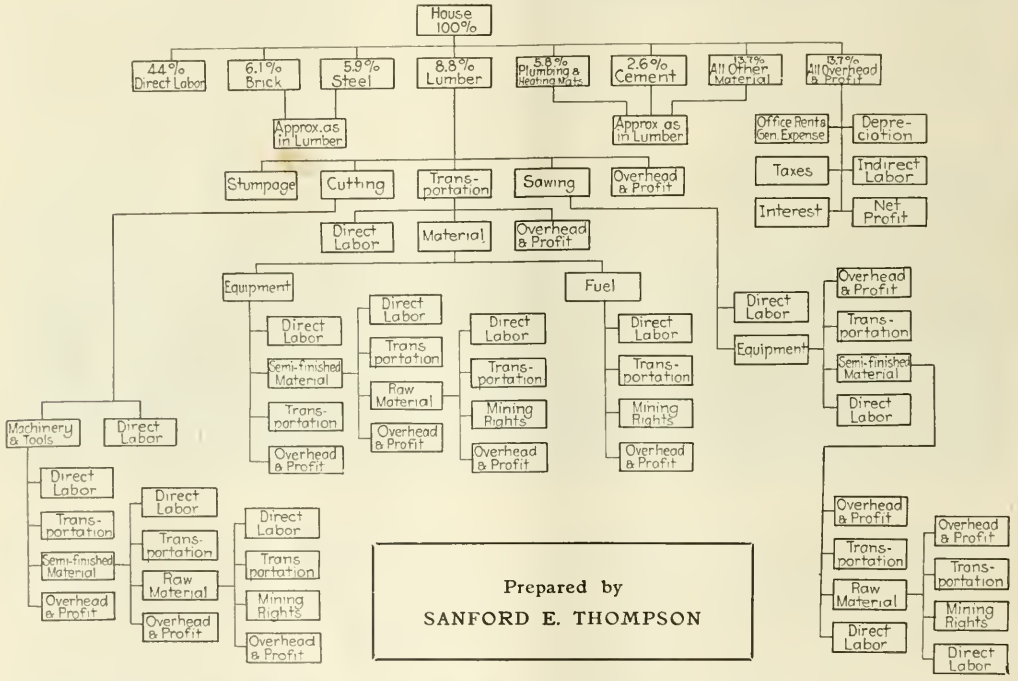
Details of Cost of Materials and Labor Shown Graphically

THE accompanying chart prepared by Sanford E. Thompson, of the Thompson-Lichtner Company of Boston, gives a bird's-eye view of the ramifications of an ordinary dwelling house. In the chart are outlined both the labor and what may be termed, from the standpoint of the builder, raw materials.

To give an idea of the complexity of the operation involved, and also to show how labor enters into every item of material and in fact into every state of the process from the wood in the forest, the manufacture of lumber is analyzed and the principal operations are shown above in blocks after the manner of a genealogical chart.

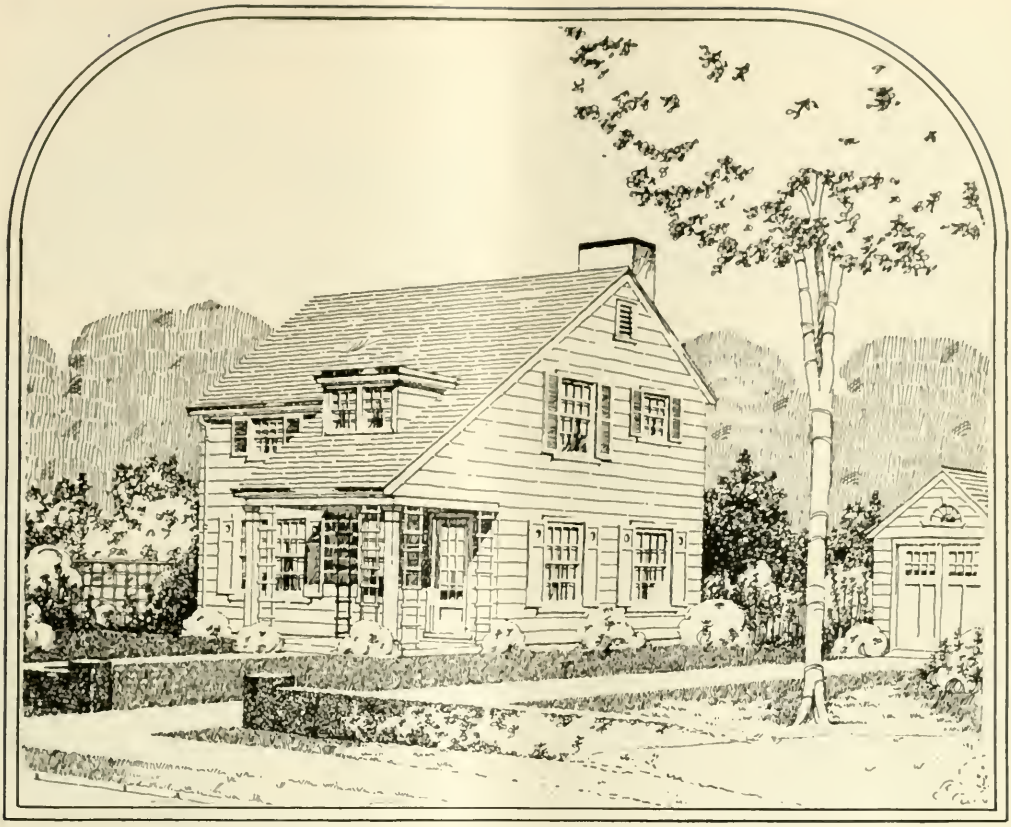
Analyses might have been made of the other materials, brick, steel, plumbing, cement, etc., but the subdivision would have been similar in nature.

The large part which labor costs compare with the total construction cost is shown in the following analysis of an imaginary composite building.



Division of Labor and Material Costs of a Composite House

	Per Cent.	
Labor		
Skilled labor and supervision	27.55	
Unskilled labor	9.44	
Office, estimating, general supervision engineering	5.60	
Liability insurance	1.41	44.00
Material		
Lumber	8.86	
Brick	6.10	
Steel	5.93	
Boilers, heating, piping	3.05	
Plumbing	2.76	
Cement f. o. b. cars	2.60	
Hardware, nails, etc	1.70	
Sand	1.69	
Electric fixtures, conduit	1.60	
Stone, slag, pebbles	1.49	
Sprinklers, unclassified items	1.04	
Building stone	0.90	
Paint	0.76	
Roofing and sheet metal	0.70	
Plastering (no sand)	0.65	
Lathing	0.65	
Steel sash, etc	0.50	
Lime (no plaster)	0.45	
Glass	0.40	
Cut stone and terra cotta	0.38	
Elevators	0.28	
Mechanical equipment (cranes, etc.)	0.21	
Tile and marble	0.10	42.88
Overhead Expense and Profit		
Office rent, taxes, interest, depreciation, general expense and overhead	5.80	
Net compensation (subcontractors)	3.90	
Net compensation (general contractor)	3.42	13.12
Total		100.00



Practical Six Room Home *of* Beauty

THE ground area of this house is small, and the plan is nearly square, with no breaks or extensions. This means marked economy in the cost of construction.

This house measures but twenty-five feet, six inches front, by twenty-two feet, six inches deep, yet; the plan arrangement allows the three main rooms of the first floor to be of good size, owing to the economical use of all available space.

But, the real feature of this house is the second floor plan; here are three good bed rooms, a bath and plenty of closets, all provided over the very modest size of the first floor, and the rooms are not small, and have full ceiling height.

Specially Designed for
BUILDING AGE
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THE BUILDERS' JOURNAL

by R. C. HUNTER & BRO.
Architects New York

Then too, the roof extending out over the porch to the first story gives the house a broader appearance that is well proportioned to its height, and it allows the house to be placed on a very narrow lot.

Small houses that are full two stories in height usually appear too high for their size, since whether the house be large or small, the ceiling heights vary but little. Small houses should be of the cottage type for the best effects, but room cannot be sacrificed on the second floor, and this is why a successful small house is hard to find. Generally small houses are either artistic and impractical, or they are practical but ugly.

The little house shown herewith combines the practical and the economical with the artistic.

Note the hall and stair arrangement, not an inch of waste space, yet the arrangement is artistic as well as economical. All of the rooms will furnish well. Cost of construction about $5,000.

Quantity Survey *of* Six Room Home

Shown on Preceding Page

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are not areas to be covered, with no allowance for waste, matching, etc. Minor outs have been disregarded.

Such items as clearing site, temporary work and protection, scaffolding and general equipment and supplies have not been included.

Such items as are marked "Unit" are to be estimated in a lump sum, following requirements of plans and specifications.

Excavation

(Excavation for pipe trenches not included)

Excavation for cellar	160	cu. yds.
Excavation for footings	11	cu. yds.
Excavation for areas	4	cu. yds.
Excavation for trench walls	7	cu. yds.
Excavation for leader drains and dry wells	6	cu. yds.
Backfilling around walls, etc.	28	cu. yds.
Leader drains and dry wells.		
Field stone for dry wells	5	cu. yds.
4 in. salt glazed tile drain pipe	18	lin. ft.
4 in. elbows	3	

Masonry

CONCRETE WORK

Concrete for cellar walls	610	cu. ft.
Concrete for footings	142	cu. ft.
Concrete for trench walls	87	cu. ft.
Concrete for area walls	84	cu. ft.
Cellar floor (3 in. concrete and 1 in. cement finish)	425	sq. ft.
Area bottoms (brick and sand)	20	sq. ft.
Porch floors (12 in. cinders, 3 in. concrete and 1 in. cement finish, colored and blocked off)	129	sq. ft.
Concrete forms	1800	sq. ft.
Pointing cellar window sills	14	lin. ft.

Brick Work

Common brickwork for chimney (or 3.3 M.)	162	cu. ft.
Face brick for hearth and jambs (or 84 brick)	12	sq. ft.
Fire brick for fireplace (or 75 brick)	15	sq. ft.
8 in x 12 in. T. C. flue lining	56	lin. ft.
3 in. bluestone chimney cap (1 ft. 10 in. x 2 ft. 8 in.)	1	

Mason's Iron Work

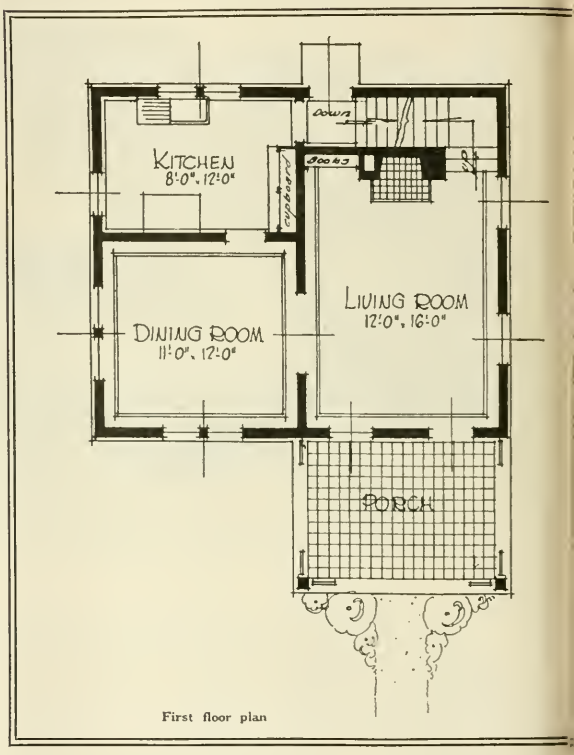
Fireplace damper (2 ft. 6 in. opg., with throat, etc.)	1	unit
C. I. ash dump	1	unit
C. I. cleanout door for ash pit (16 in. x 12 in.)	1	unit
C. I. cleanout door for boiler flue (8 in. x 8 in.)	1	unit
Thimble for boiler flue (8 in. dia.)	1	unit

Plastering

Three coat Patent plaster on metal lath, gross (Net 420 sq. yds.)	485	sq. yds.
G. I. corner beads	72	lin. ft.

Tile Work

Tile work for Bath Room.		
Floor (1 in. hex. white)	42	sq. ft.
Wainscot (3 in. x 6 in. white wall tile)	104	sq. ft.
6 in. sanitary base	26	lin. ft.
Moulded cap	26	lin. ft.



First floor plan

Sheet Metal Work

Tin roof on dormer	75	sq. ft.
Copper flashing for roofs, etc.	13	lin. ft.
Copper flashing for column caps	2	caps
Copper flash and counter flash for chimney	14	lin. ft.
3 in. copper leaders	47	lin. ft.
Bends for leaders	8	
Gutter thimbles	4	
3 in. x 4 in. G. I. gas range vent	22	lin. ft.
Cap and thimble for same	1	

Carpentry

TIMBER

All No. 1 common stock, hemlock, rough unless noted.

Cellar Girders—		
6 in. x 10 in. spruce—1/12, 1/8	100	F. B. M.
2 in. x 3 in. nailer—40 lin. ft.	20	F. B. M.
Sills—		
4 in. x 6 in.—2/14, 4/12, 2/1	192	F. B. M.

Posts—
4 in. x 6 in.—4/18 ..... 144 F. B. M.

Studs, girts and plates, 1st floor—
2 in. x 4 in.—138/8 ..... 693 F. B. M.

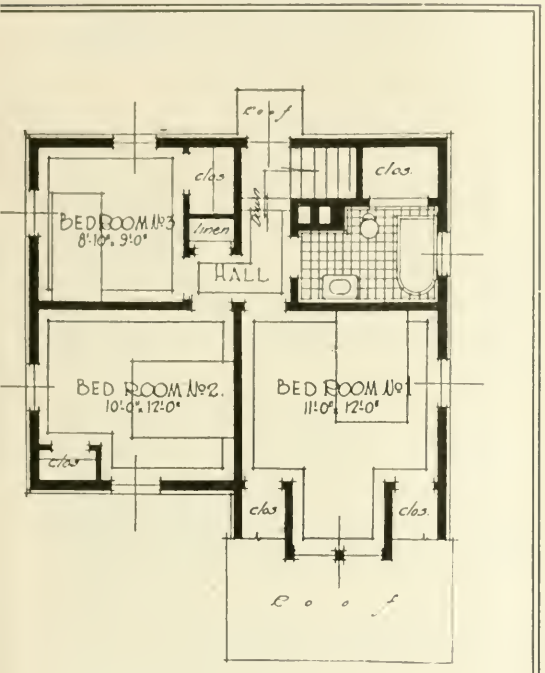
Studs, etc., 2nd floor—
2 in. x 4 in.—196/8 ..... 1044 F. B. M.

1st floor joists—
2 in. x 8 in.—30/12 ..... 480 F. B. M.

2nd floor joists—
2 in. x 8 in.—34/14 ..... 597 F. B. M.

2nd floor ceiling beams—
2 in. x 6 in.—32/14 ..... 449 F. B. M.

Rafters—
2 in. x 6 in.—15 14, 25/12 ..... 510 F. B. M.



Second floor plan

Ridge—
2 in. x 8 in.—1/14, 1/2 ..... 35 F. B. M.

Porch ceiling beams, etc.—
2 in. x 4 in.—21/12 ..... 168 F. B. M.

Plates—
2 in. x 6 in.—2 12, 2/10 ..... 44 F. B. M.

Col. cores—
4 in. x 4 in.—2/8 ..... 22 F. B. M.

Floor bridging—
2 in. x 2 in.—250 lin. ft. ..... 83 F. B. M.

Cornice outlookers—
2 in. x 4 in.—4/8 ..... 22 F. B. M.

Studs for cellar partitions—
2 in. x 4 in.—6, 14 ..... 56 F. B. M.

Sheathing—(7/8 in. x 8 in. shiplap) no outs—
Walls—to cover ..... 1750 sq. ft.
Flat roofs—to cover ..... 60 sq. ft.

Sheathing paper (waterproof) ..... 1800 sq. ft.

Shingle lath, 7/8 in. x 2 in. ..... 1900 lin. ft.

Grounds—
3/4 in. x 2 in., surfaced one side ..... 1500 lin. ft.

Sheathing for cellar partitions—
7/8 in. x 8 in. shiplap—to cover ..... 95 sq. ft.

Rough flooring—7/8 in. x 8 in. shiplap
1st floor—to cover ..... 450 sq. ft.

Furring (7/8 in. x 2 in.) ..... 200 lin. ft.

Shingle roofs (18 in. stained shingles)
7.5 squares ..... 5200 shingles

Shingle sides (24 in. stained) ..... 4800 shingles
14.5 squares

Exterior Finish

Watertable (7/8 in. x 2 in. strip) ..... 94 lin. ft.

Main cornice—
4 in. x 4 in., moulded wood gutter ..... 54 lin. ft.
3/8 in. x 8 in. soffit ..... 54 lin. ft.
7/8 in. x 6 in. fascia ..... 54 lin. ft.

Raking cornice—
1½ in. x 2 in. cove ..... 92 lin. ft.

Dormer cornice—
7/8 in. x 6 in. fascia ..... 20 lin. ft.
7/8 in. x 6 in. soffit ..... 20 lin. ft.
2in cap mould ..... 20 lin. ft.
2 in. bed mould ..... 18 lin. ft.

Porch finish—
7½ in. x 7½ in. box cols. 7 ft. 10 in. long, with cap and base 2
Lattice panel 1 ft. 6 in. x 7 ft. 10 in. 6
7/8 in. x 6 in. soffit ..... 31 lin. ft.
7/8 in. x 4 in. soffit ..... 18 lin. ft.
7/8 in. x 8 in. frieze ..... 31 lin. ft.
7/8 in. x 3 in. frieze ..... 31 lin. ft.
1½ in. neck mould ..... 31 lin. ft.
2 in. bed mould ..... 31 lin. ft.
5/8 in. x 7/8 in. cove ..... 46 lin. ft.
5/8 in. x 4 in. M. & B. ceiling, to cover ..... 104 sq. ft.

Louvres—
1⅛ in. fixed slats, frames, outside trim, etc., wire screens on back—
1 ft. 0 in. x 2 ft. 0 in. 2

Windows—
Frames complete with sash, outside trim, etc.—
Sash 1½ in. thick, glazed D. T.

Cellar windows (trim both sides)—
Single top hung casem. sash 3 ft. 0 in. x 2 ft. 0 in., 4 lgt. 4

First floor windows—
Single D. H. sash, 2 ft. 4 in. x 4 ft. 10 in., 16 light 3
Mull. D. H. sash ea., 2 ft. 10 in. x 4 ft. 10 in., 16 light 1
Single D. H. sash, 2 ft. 6 in. x 3 ft. 2 in., 12 light 1
Mull D. H. sash ea. 2 ft. 6 in. x 3 ft. 2 in., 12 light 2

Second floor windows—
Single D. H. sash, 2 ft. 10 in. x 4 ft. 6 in. 16 light 5
Single D. H. sash, 2 ft 6 in. x 3 ft. 2 in., 12 light 1
Mull D. H. sash ea. 2 ft. 6 in. x 3 ft. 2 in., 12 light 1
Single D. H. sash, 3 ft. 0 in. x 3 ft. 4 in., 16 light 1

Shutters (1⅛ in. thick, solid paneled)—
2 ft. 10 in. x 4 ft. 11 in. pr. ..... 3 pr.
2 ft. 6 in. x 3 ft. 3 in. pr. ..... 3 pr.

Blinds (1⅛ in., removable louvres, etc.)
2 ft. 10 in. x 4 ft. 7 in. pr. ..... 5 pr.
3 ft. 0 in. x 3 ft. 5 in. pr. ..... 1 pr.
2 ft. 6 in. x 3 ft. 3 in. pr. ..... 1 pr.

BLUE Print Plans and Specifications of many Beautiful Homes of Moderate Cost can be supplied at a nominal price by Building Age and the Builders' Journal, 912-920 Broadway, New York.

Exterior Finish—Continued

Exterior door frames (1¾ in. thick, rabbetted). Complete with outside trim—		
Frame for front ent. door, 2 ft. 10 in. x 7 ft. 0 in.	1	.....
Frame for rear ent. door, 2 ft. 6 in. x 6 ft. 8 in.	1	.....
Exterior doors (all to detail)—		
Front ent. doors, 2 ft. 10 in. 7 ft. 0 in., glazed D. T.	1	.....
Rear ent. door, 2 ft. 6 in. x 6 ft. 8 in., glazed D. T.	1	.....
Finished flooring—		
⅞ in. x 2¼ in. comb. grain Y. P., 1st and 2nd stories—to cover	830	sq. ft.
Lining paper under floor	500	sq. ft.
Cement filled pipe cols. in cellar—		
4 in. dia. x 7 ft. 6 in. long, with cap and base	2	.....
Joists hangers (¼ in. x 2 in. W. I.)—		
For 2 in. x 8 in. beams	4	.....
For 4 in. x 8 in. beams	2	.....

Interior Finish

Door trim (whitewood)—		
⅞ in. jamb, ½ in. stops, ⅞ in. x 4¼ in. moulded and mitered trim. Trim both sides.		
For doors 2 ft. 6 in. x 6 ft. 8 in.	5	sets
For doors 2 ft. 4 in. x 6 ft. 8 in.	1	set
For doors 2 ft. 2 in. x 6 ft 0 in.	2	sets
For doors 4 ft. 0 in. x 3 ft. 0 in. (to bath room clos.)	1	set
For doors 2 ft. 2 in. x 6 ft. 8 in.	3	sets
Trim for inside of exterior doors—		
Front ent. 2 ft. 10 in. x 7 ft. 0 in.	1	set
Rear ent. 2 ft. 6 in. x 6 ft. 8 in.	1	set
Trimmed opgs. finished same as for doors—		
Opg. 5 ft. 0 in. x 6 ft. 8 in.	1	set
Trim for windows (whitewood)—		
⅞ in. x 4¼ in. moulded and mitered trim, ½ in. stops.		
1⅛ in. moulded stool with cove under, ⅞ in. moulded apron.		
For windows, single, 2 ft. 10 in. x 4 ft. 10 in.	3	sets
For windows, mull ea. 2 ft. 10 in. x 4 ft. 10 in.	1	set

Interior Finish—Continued

For windows, single 2 ft. 6 in. x 3 ft. 2 in.	2	sets
For windows, mull ea. 2 ft. 6 in. x 3 ft. 2 in.	3	sets
For windows, single 2 ft. 10 in. x 4 ft. 6 in.	5	sets
For windows, single 3 ft. 10 in. x 3 ft. 4 in.	1	set
Base—		
⅞ in. x 6½ in. moulded	250	lin. ft.
⅞ in. x 4 in. plain (closets)	60	lin. ft.
2 in. base mould	250	lin. ft.
½ in. quarter round floor mldg.	310	lin. ft.
Picture moulding (⅞ in. x ¼ in)	218	lin. ft.
Mantle for Living Room	1	unit
Bookcase for Living Room (3 ft. 6 in. x 4 ft. 6 in.)	1	unit
Seat for Bed Room No. 1 (5 ft. 6 in. long)	1	unit
Interior doors—		
(2 cross panel birch veneer)—		
Door 2 ft. 6 in. x 6 ft. 8 in. x 1½ in.	5	.....
Door 2 ft. 4 in. x 6 ft. 8 in. x 1½ in.	1	unit
Door 2 ft. 2 in. x 6 ft. 8 in. x 1½ in.	3	.....
Door 2 ft. 2 in. x 6 ft. 0 in. x 1½ in.	2	.....
Pr. Doors, 4 ft. 0 in. x 3 ft. 0 in. x 1⅛ in.	1	unit
Scuttle to attic, 2 ft. 4 in. x 3 ft. 0 in., with trim, etc.	1	.....
Closet shelving (⅞ in. x 12 in. pine)	36	lin. ft.
Hook strip (⅞ in. x 4 in.)	30	lin. ft.
Rabbeted shelf cleat	30	lin. ft.
1 in. dia. pipe clothes rod	16	lin. ft.
Kitchen cupboard (front 5 ft. 0 in. x 8 ft. 0 in.), countershelf, drawers, doors, etc.	1	unit
Slat floor under laundry tubs, 3 ft. 0 in. x 4 ft. 0 in	1	unit
Main stairs, 1st to 2nd story, 14 risers, 3 ft. 0 in. wide, box pattern, wall hand rail, etc.	1	flight
Cellar stairs, 12 risers, 3 ft. 0 in. wide, box pattern, wall hand rail, etc.	1	flight

General Conditions

Add for permits, fees for water and sewer connections, etc., insurance and general overhead charges. Allow for general work not listed, such as grading, planting, etc. Include sub-bids: Hardware and applying same; painting and decorating; plumbing and gas fitting; heating and electric work.

Horizontal *vs* Diagonal Sheathing *for* Stucco Houses

IN many sections it has been common practice for years to place sheathing boards for stucco houses diagonally over the studs. The principal argument for placing sheathing boards in this fashion was that it acted as diagonal bracing for the frame work and gave a very stiff structure.

The full size stucco panel tests conducted by the Bureau of Standards have apparently proved that horizontal sheathing is preferable to the older diagonal form. The following is an extract from the report of the Committee on Treatment of Concrete Surfaces of the American Concrete Institute:

"When sheathing is used, it should be laid horizontally and not diagonally across the studs. The stucco test panels erected at the Bureau of Standards in 1915 and 1916 have demonstrated conclusively that diagonal sheathing tends to crack the overlying stucco by setting up strains in the supporting frame.

"This result is undoubtedly due to the shrinkage of the sheathing, and whatever benefit might be anticipated from the more effective bracing provided by diagonal sheathing appears to be more than offset by the shrinkage effect. Diagonal sheathing is also less economical than horizontal sheathing, both in material and labor."

Of course, when sheathing is laid horizontally adequate diagonal bracing should be provided at the corners. A good form of bracing is a piece notched into the back faces of the studs, each brace being continuous and having no joints.

MASONRY
Practical Information on Materials and Latest Construction Methods



Some Hints *on* Cobble Stone Work

By JOHN UPTON

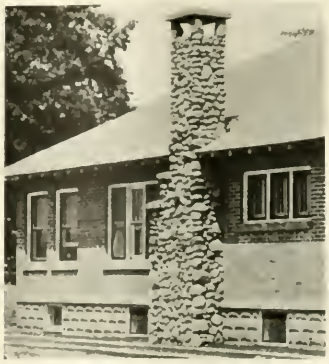
JUST the proper way to use cobble stones depends somewhat on the size and shape of the stones and the work for which they are to be used. If one could see the stones and get an idea of the work he could then give more exact details but I will try and give a few ideas which may help.

Where the stones are as large as a man can readily lift, they are laid up as is the case with squared and dressed stone, using a line and plumb bob, except that they are usually allowed to project more beyond the line so as to bring out the projections more prominently. The less there are the more they project, that is, where there is only a little cobble stone work on a house, as the porch piers or chimney foundation, it must be made conspicuous but where there is a lot of it this feature should not be over done.

Where the stones are mixed, large and small, the larger ones are placed at or near the bottom of the work and the smaller ones used higher up. For these smaller stones one may use a sort of form. Guides may be set up for the corners and loose boards put in between and moved up as the work proceeds.

If the work is to go to a considerable height it may be well to use forms from the start. These are partly to keep the work true to line and partly to hold them in place till the mortar sets, though one can not rely entirely on the mortar to hold them, as each stone, must be so placed that it will stay in without depending entirely on the mortar. As the mortar must not come to the face of the wall or at least not beyond the face as far as the stones, it is well to fill the outer edge of the form with sand which will fall out when the forms are removed. This is done by laying the stone first in mortar and then putting in the sand.

This cobble stone work is generally battered, that is made larger at the bottom than at the top. There are two good reasons for this. It is more stable, looks better and last can be more readily built this way as it would be difficult in some cases to carry the work up plumb. But it can be gradually drawn in and even though it may not exactly come to the line no harm is done nor is the difference noticeable.



Cobble stones make artistic chimneys

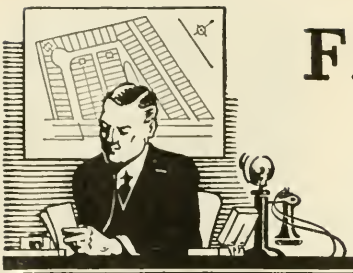
A good rule to remember is to start large enough at the base and then draw in as needed. Do not make any attempt to put the stone in courses. When you lay a large one place a smaller one next. Do not have the mortar too wet, and when the work is finished the joints will need to be raked out and pointed with a richer mortar, which must be kept well back from the face of the wall.

The color of the mortar may be varied by using a different brand of cement, or coloring may be used if desired. Next to the frames for doors and windows it will be necessary to use more mortar and this may need a narrow form to hold it till set.

At the top of the wall where it is to be made level for a sill or cap stone it may be well to use a form, or if there is a cap of concrete it should be built in place.

In this work one should use care in bonding the stones, as much as with dressed stone or more. All stone should lie on the natural bed. There should be headers and stretchers as well as through bond stones, and the mortar must be of good quality to do its part in making the work stable. It should have a large proportion of cement, if lime is used.

The corner stones should be large and long, to form a bond to tie the two walls together. These may need some dressing to make them fit. While the use of spalls or chips for blocking and levelling may be all right to some extent, it must not be overdone.



FINANCE and REAL ESTATE

Helpful Data for the Builder Who Builds to Sell

Financing Home Building

THE desire of every man and woman is to own a home of their own. Home ownership calls for an investment usually beyond the reach of the man or woman of limited income. Premiums, commissions and high interest rates are inclined to be a burden difficult to surmount. By the time this load is carried there is nothing left to apply on the principal, so the actual ownership of the home always stays in the distance.

Builders realize this and if some methods can be used to make the financing easy, more homes would be built. Today we see any number of earnest, industrious workmen who want to own their home, who are paying more for rent than would carry a house of their own. The trouble is that they haven't enough cash on hand to make a first payment of the amount as demanded by lending institutions. Paying high rent keeps them with their nose to the grindstone and they just cannot help themselves.

In cases of this kind, the plan of the United Home Owners of Washington, D. C., is of interest, as one member helps the other in acquiring the ownership of their homes and they in turn help each other.

That, in short, is the story of this plan which has been in operation for many years. In the article on page 60 of the July issue of the BUILDING AGE and the BUILDERS' JOURNAL certain features of the plan were not explained fully, the following notes clearly show some of the other advantages offered:

Any person desiring to secure a loan with which to buy or build a home simply makes application on the regular form which is dated, showing the exact time the application is made and which determines the exact order in which they will be entitled to secure a loan.

With the application one begins making monthly payments of 1% of the amount one desires to borrow. Upon receipt and acceptance by the United Home Owners of the application, a contract is executed.

The contract is a specific agreement in which all the terms and conditions are fully and plainly set forth. All questions are settled by reference to the terms of the contract.

CONTRACTS are placed in series totaling substantially $500,000, face value each. Every series operates independently, the contract holders thereof creating their own funds.

As soon as the accumulation in the loan fund, from its monthly contributors, monthly repayments on loans and other sources of accumulation, has reached the amount desired by the borrower, he is entitled to receive a loan equal to the amount of the face value of his contract.

All loans are secured by mortgages on real estate and are repaid at the rate of $7. per month per $1,000, face value of contract, with interest at the rate of 4% on the yearly unpaid balance.

IN approximately 11 years' time the borrower repays the loan, owns his home and during all this time has never paid out any more in any one month than what would ordinarily be paid as the rent.

There are four main features of the United Home Owners' plan, namely, the long time, easy repayment plan, the extremely low rate of interest, six months' grace in case of sickness or disability, and fourthly, the privilege of paying the entire amount.

There is also an investment feature of the plan, and in order to explain it we assume that when a contract matures for a loan the owner of the contract has changed his mind and decided not to buy or build. He has acquired a valuable borrowing privilege which has a market value and is in great demand. He notifies the trustees of the United Home Owners and they, through their fiscal agents, the Prudential Homes Company, of New York, will sell that borrowing privilege, the sale of which easily brings a premium of from $100 to $150 per $1,000.

At first glance this premium may appear to be an excessive one for a home owner, but when it is added to the total rate of interest charged and spread over a period of approximately 11 years, the total cost is considerably less than the rate usually charged. For instance, it is showr that the interest on $1,000 under the plan of this organization, covering a period of nearly 11 years, cannot exceed $210.41. If $150 premium is added the total charge is only $360.41.

Dignity *and* Convenience Features *of* This Bank

THE LYTLE COMPANY,
Architects



Dignity shown in Exterior Design.



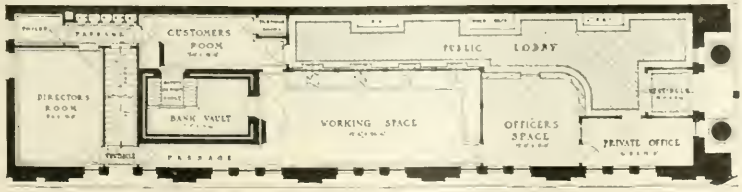
Interior view from entrance.

CORNER locations seem to be the favored ones for a bank and sometimes the frontage of these lots is quite narrow. To design a narrow building that will have a good appearance is quite a problem and calls for careful design.

In the building shown here, the width is only twenty-two feet with a depth of ninety feet. It was erected for the First National Bank at Iowa Falls, Ia. The building is faced with blue-black tapestry brick trimmed with cream colored terra cotta, with base of granite.

The interior, as our picture shows, has a very dignified appearance. The counters, etc., are of green veined cream colored marble with the woodwork of Tabasco mahogany. The front door is of bronze as well as the gratings in the different partitions.

The ceiling and walls are ornamented with plaster beams and cornices with relief work, all of which was decorated in harmonious colors and produce a very rich looking interior. The floor in the public space is laid with Mosaic tile and the balance of the floors are covered with a quarter-inch thick composition flooring. The customers are provided with a room from which they can enter the safe deposit vault which is partitioned off from the main bank vault. Taken as a whole, both exterior and interior combine to form a bank building of beauty and convenience.



FLOOR PLAN

Exceptionally well arranged working and public space has been provided in the floor plan which also retains the desirable feature of the central entrance.

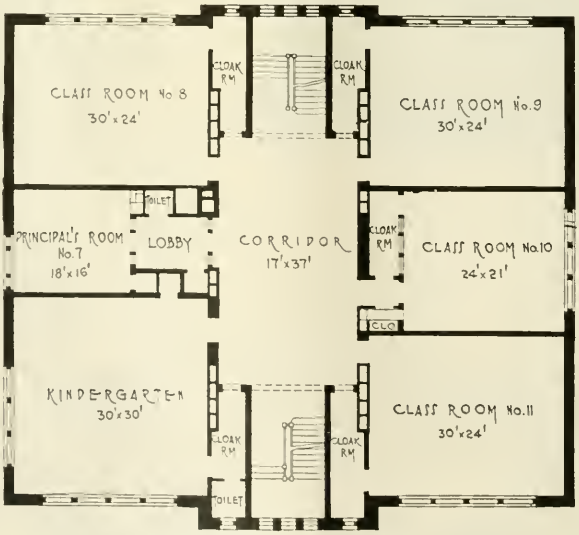


Brick School *of* Attractive Design

HEACOCK & HOKANSON, Architect:

REPORTS of building activity show a number of schools now being erected in different parts of the United States. This is an exceedingly good sign of the progress of the times, and, better yet is the report of the number of school buildings contemplated. It seems quite certain that builders will have a good deal of school work to do for the next few years.

The rather interesting school design shown here was built at Riverton, N. J., from plans prepared by Heacock & Hokanson, of Philadelphia, the general contractor on the job being Mr. John Tait, of Camden, N. J. A plan of the first floor is shown. Note that there are entrances both at the front and rear with a very wide corridor between on which the class rooms open. The second floor is divided into class rooms similar to that shown for the first floor.



The second floor arrangement is similar to this first floor

The building is built of brick with trimming of limestone. The lintels are of brick, the majority being laid perpendicular in soldier courses and for others a flat arch has been formed. This, together with the soldier belt courses produce a very interesting study in brick work.

The high perpendicular triple window over the main entrance is an unusual feature of the design. This, of course, is on one of the upper landings and extends to the ceiling of this top floor. It provides excellent light for stairway and corridor besides forming the feature of the outside design. The basement contains play rooms, etc.

The Coal Crisis Creates Popular Interest in Heating Small Homes by Oil

Builders Giving Attention to Automatic Working Heating Plants That Eliminate the Dirt and Work of Coal and Ashes

By A. V. HUTCHINSON

EVERY home builder's ambition is to discover some way of having his home heated to a comfortable temperature, without the exertion required to shovel in coal and shovel out the ashes, as well as to eliminate the dust and dirt accompanying these operations. His wish, to just push a button and have heat, can be gratified now, thanks to skill of engineers, who have attained their objective in perfecting oil burning equipment for small house heating plants.

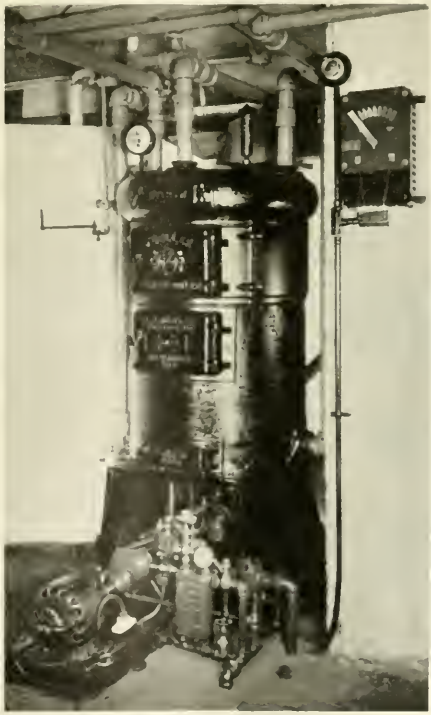
Just imagine being able to lie in bed and know that the house will be at a temperature of 70 deg. in the morning without any effort on your part, or that just the throwing of a switch in the bedroom will start the burner immediately. Many reasons can be found for the impetus given fuel oil burning devices beside coalless days, shortage due to strikes and transportation and high prices.

The advantages that recommend fuel oil for domestic use are its cleanliness, uniform temperature and flexibility in meeting weather change, efficient and smokeless combustion, the fact that it is not affected by weather conditions, that less labor is required for operation, ash removal and minimum space needed for storage.

The present styles of oil burning devices are in the nature of attachments to existing types of coal burning boilers and furnaces, which can be quickly and economically changed for attaching the oil burner. The most important items are the installation of the oil storage tank and piping, which are governed by the fire underwriters' rules and local ordinances. Four distinct types of burners have been developed, and each has a big following in its particular section.

One of the first places to use oil for heating the home was the Pacific coast, and special burners for California crude oil were made. Oil burners also have made their appearance in the Middle West and East, and are adapted for the kind of fuel oil available. These have withstood the severe test of actual service for several years with entire satisfaction to the owners both from a service and cost standpoint.

Where the winter weather is severe, burners that are automatically controlled are popular, while in the far west, where intermittent service is all that is required, rotary burners are in the leading position. They burn a heavier grade of oil than the other types found farther east. In recommending which is the right burner for a house heating plant the builder should consider the following factors: Is service or economy desired? What will be the nature of the service required? Is fuel oil easily obtainable? What is the best type of burner?



Automatic oil heating device attached to small steam heating boiler

For ideal heating the two governing factors are efficiency and economy, and when oil is used as the fuel these two conditions rest to a large extent upon the burner. Efficient service requires that the burner must be positive in action, able to operate over long periods without attention and convert the oil into such form that the greatest amount of heat will be realized from a given amount of oil, without noise or dirt.

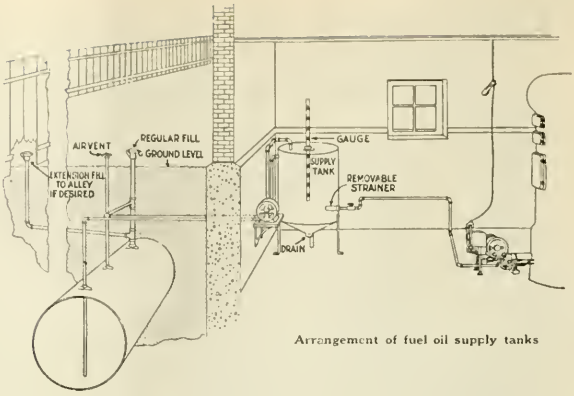
A vaporizing type of burner is designed for round steam and hot water boilers rated up to 500 sq. ft., warm air furnaces with fire-pot diameters of 18 to 26 in., and in a different arrangement for square sectional end boilers. The burner is held in the fire-pot on a standard, the goose-neck of the manifold resting on the fire-door ledge. Oil from a cellar tank flows under pressure to the vaporizing tube or generator, from which the vapor flows through a hand-controlled needle valve into the manifold to the burner heads. The height and volume of the flame are controlled, and there are no moving parts to get out of order. To start the burner either a gas flame or an alcohol primer is used. The cellar storage tank is fitted with an air gauge and

motor driven air compressor or hand pump if electric current is not available. Little attention is required by this burner, it being necessary to regulate the flame about twice a day, the air compressor being automatically controlled.

Automatic Working Systems

Three burners atomizing the oil mechanically and operating under thermostatic control are the Nokol, Aeroil and Williams. A uniform temperature of 70 deg. or any other desired temperature can be maintained, and the home owner need never worry about going home to tend to the fire.

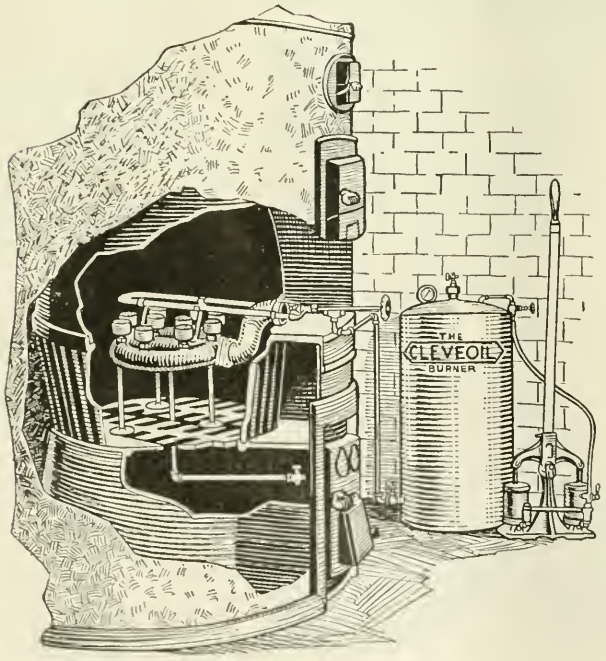
Nokol consists of a thermostat and electrical control box attached to a blower or atomizer, a combustion chamber with constantly blowing pilot light and oil storage tank. Oil flows to float chamber, where needle valve maintains proper level. Action of thermostat starts blower, causing fine spray of oil to be fed in combustion chamber, where pilot light ignites it. Safety devices will shut off oil if pilot light fails, if dirt interferes with needle valve action the machine will stop, failure of current will cut off oil, so that every precaution has been provided. Nokol is made for steam and hot water boilers and warm air furnaces, and has received approval from the National Board of Fire Underwriters.



Arrangement of fuel oil supply tanks

Aeroil is a burner made in four sizes to handle house heating boilers rated from 500 to 10,000 sq. ft. of radiation. A motor driven blower and oil pump are mounted on standards directly in front of the feed door, and the oil and air line enters the fire chamber, turn downward and discharge the flame against a special deflecting plate resting on the grate. When the thermostat acts the oil lights from a constantly burning pilot light, the burner operating until the home is raised to the proper temperature.

The Williams burner is automatic, oil being delivered to an atomizing chamber, where it is mixed with the correct amount of air supplied by a blower driven by an electric motor. A special control switch and thermostat complete the equipment, which will handle house heating systems rated up to 10,000 sq. ft. of steam radiation.



Oil burner installed in hot air furnace with hand operated air compressor

Atomizing by Steam

Oil for the Caloroil burner is atomized by means of steam, a generator being mounted on the base plate located in the firebox of the heater. An oil tank supplies the oil nozzles automatically, water is supplied from the city main to the steam generator, and the steam escapes from specially designed nozzles and combines with the required amount of oil and air for proper combustion. A gas or gasoline primer is provided for starting the burner, and the control is by means of a thermostat if desired.

All of the rotary types of burners are hand-fired, as they are used in communities where intermittent heating is required. The intense flames made by these burners make it necessary to brick-up the fire-pot of the heater for best results.

The Ray burner is a very compact unit, consisting of a totally encased motor with extended hollow shaft to center of which worm gear is fastened, and with blower and atomizer at opposite ends. It is made in a number of sizes for boilers and furnaces, for either direct or alternating current. The burner is fastened to the ash-pit door hinged so that it can be swung out of the way.

Atomizing by Centrifugal Force

In the Johnson rotary burner the oil is atomized by a centrifugal device and is made for heating plants rated up to 10,000 sq. ft. of steam radiation. The fire is started by closing the motor switch, turning on the oil regulating valve and holding a light in the fire box. Thermostatic action will turn off the burner when the proper temperature is reached. Johnson burners are made for either direct or alternating current, are hinged to the ash-pit door and are made with or without oil pump.

An oil burner for boilers as small as 250 sq. ft. rating are the Fess types. Oil is atomized by rotary action and mixed with the right amount of air supplied by a blower. Air and oil are carried by separate lines, and a novel burner construction produces an intense but soft flame.

Efficiency of House Heaters

Experience and tests have shown that the efficiency of house heaters had been raised by 15 to 20 per cent. when oil fuel is used. Quicker response from the heater is possible and greater efficiency is obtained from fuel oil. It must always be remembered, however, that a heating plant with an oil burner attachment is only as efficient as the boiler or furnace to which it is attached even though all of the heat units are obtained from the oil.

What Will It Cost?

One of the particularly pertinent questions that will be brought up by the home builder will be, "What will it cost to heat with oil?" This cannot be answered for the whole country by one statement, but an outline of some of the factors entering into the selection, installation and operation of oil burning units should be considered, and will give a basis for accurate judgment. First is character of building; second, style, condition and efficiency of heater, amount and cost of coal consumed, labor and cost of ash removal and firing of coal, dirt and inconvenience involved.

It has been found that 100 gallons of oil will do the same work as 1 ton of high-grade coal when good operating conditions exist. The oil used in the various burners ranges from 26 to 38 Baume, so that by getting the price of the kind used it is easy to figure how it will compare with coal in cost. Tank wagon delivery for New York is about 8 cents per gallon.

Figures on Oil Consumption

A Chicago installation, with an automatically controlled mechanical atomizing burner, operating for 151 days during the 1920-21 heating season, in a steam boiler supplying 475 sq. ft., consumed 1,485 gallons of oil, or an average of 3 gallons per hour, to maintain a constant temperature of 70 deg. As the maintaining of a uniform temperature with coal is possible only when constant attention is given the heater, and, as this is infrequent with the average home installation, it is safe to assume that when coal was burned in this house during the night, when the fire was banked, that the room temperature was around 50 deg. for some hours. This might mean that a little more than 100 gallons of oil was used to a ton of coal, though no figures are available. However, the owner feels satisfied that the comfort derived more than compensated for the few extra dollars.

With the average house construction and to be on the safe side figuring an oil consumption of 100 to 120 gallons of oil equal to a ton of coal would be good practice. The vaporizing burners will show a lower fuel consumption than the mechanical burners, and these figures can be beaten if thermostatic operation is used only in severe weather.

Study of Fuel Oils

Some knowledge of the properties of fuel oil are desirable, for the oils from the different fields vary in content, but vary slightly in heating value. Fuel oil is a refinery by-product resulting from the distillation of crude petroleum. It is heavier than the crude from which it comes, and will not burn readily until atomized or vaporized and mixed with the proper amount of air. A blazing stick or live coal will die out before it will ignite the oil.

The questions of oil supply and storage are of vital concern when considering its use for heating. Present production and consumption, though very large, will not exhaust available supplies for many generations, and in this country large untouched shale areas promise much, according to Geological Survey reports. Present pipe line transportation methods from oil fields to refineries insures a continuous supply in all kinds of weather, so that in areas adjacent to refineries and distributing centers plenty of fuel oil is assured.

Storage of Oil

The reserve storage tanks, recommended by burner makers to house owners, range from 250 to 1,000 gallons capacity, depending on the estimated consumption. On the Pacific Coast as much as a month's supply in reserve is often provided.

Underwriters' rules and local ordinances govern the storage of oil in homes, and the burner manufacturers have met these specifications in designing their apparatus. Pumps, air pressure, hydraulic, gravity (where permitted), and other patented systems are used and have been perfected and simplified.

Less Space Needed

In addition to the cleanliness and other advantages of uniform temperature, ease of control and minimum attention required when oil is burned, the home builder can figure to use the basement or cellar for something more than a rough storage space.

With a little space necessary for oil storage plenty of room is available for a billard room, playroom, maid's room or something of the kind, which would be impossible when coal is used, because of dust and dirt and the room it requires for its storage—about 45 cubic feet per ton.

Advantages to Builders

Also there is the commercial side, for the builder who sells his house. If an oil system with its many advantages is installed an exceedingly good sales and service argument is available, and the house will command a better price with but little extra initial cost. There are many places where oil can be successfully used for heating the home, but care should be exercised so that perfect satisfaction will be assured.

English Design Bungalow

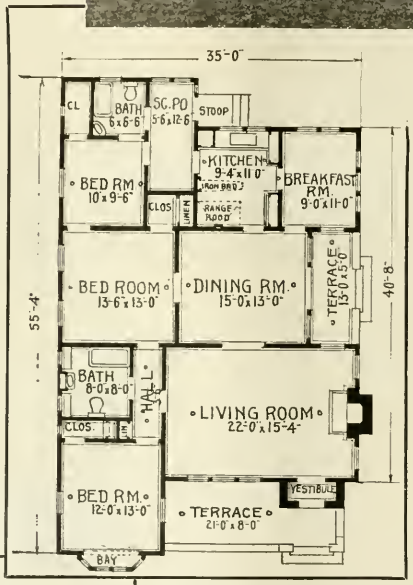
With Two Floor Plans

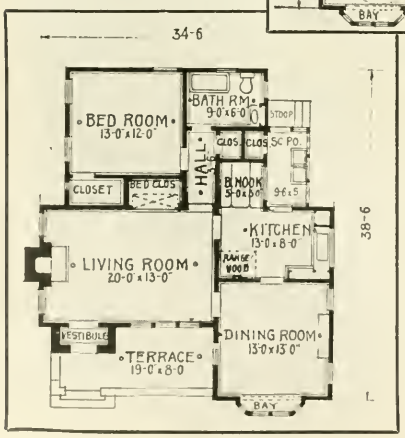
By CHARLES ALMA BYERS



THE bungalow shown here, patterned after the quite popular English-cottage style, constitutes a home of which almost anyone might justly feel proud. The street view of it is, in fact, unusually attractive. It is also of a style to make it uncommonly satisfactory for duplication in any climate.

Interesting and enhancing outside features of this house that deserve especially to be brought to attention are the little vestibuled front entrance, the wall-enclosed and cement-paved terrace on the front, the street-presented bay of windows, and, further, as it is here actually planned and built, the small secluded terrace or porch on the side, off one end of the dining room.





The front doorway to the vestibule, incidentally, is here designed as but an open arch, but it could be, of course, for cold climates, provided with a door to enable its being closed. Even the effect accomplished in the steeply pitched roof, by the doubling of each fourth course of singles, adds much to the house's general attractiveness.

The walls of this house are of frame construction with an exterior finish of cement-stucco, in very light gray. The walls of the entrance vestibule, however, as well as the terrace enclosure and the chimney on the side, are of dark red brick. The liberal amount of wood trimming is painted white, while the front door is of dark-finished oak. The shingled roof is painted greenish gray, and the front and side terraces are floored with white cement, like the paving of old walks. The main foundation is of poured concrete.

Two floor plans, of materially different sizes and arrangements, are offered for creating the same front appearance, the small one, however, being a reversal of the other. The house here is built on the larger scale, which is comprised of living room, dining room, breakfast room, kitchen, three bed rooms and two bath rooms, besides the usual kitchen-entry porch. The back bed room, directly off of which is the smaller bath rooms, is, of course, primarily intended as a maid's room. The other plan, it will be seen, contains but one bed room, while adjoining one corner of its kitchen is a little breakfast nook. The living room in this case is equipped with a closet bed, to enable its being used as an emergency sleeping room.

Both plans are liberally provided with built in conveniences. Bed rooms naturally possess large clothes closets.

The house has neither basement nor furnace, but the one or the other might have been provided, with a stairway leading thereto from the kitchen-entry porch. It is equipped with gas radiators built into the floor, for heating, and with all other modern conveniences. It is built in Los Angeles, California, and was designed by E. B. Rust, of that city.

Round Barn Design

INDICATIONS point to prosperity on the farms and, therefore, it is to be expected that there will be a good deal of building activity in the rural sections.

The operation of the Federal Farm Loan Act will furnish the means whereby farmers may finance any desirable improvement, hence builders can obtain many good contracts by getting in touch with the farmers in their locality.

The builder should be ready to talk on any part of farm building. He should have on hand quite a number of designs of different sorts of barns and out buildings; also the interior equipment, as that



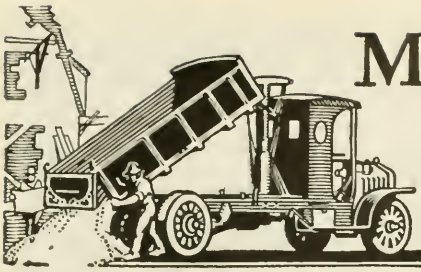


is also of much importance to the farmers. By way of interesting contrast, we are publishing this month two pictures of a round barn as this design has many features that commend itself to the farmer. Many are loud in their praise of its convenience.

A silo is, of course, the beginning of the round barn; it is located in the center and the ensilage is taken directly from the bottom doors and placed into the mangers with the least amount of carrying. A narrow concrete alley extends all around the silo and this enables the attendant to easily reach every manger.

Hay storage space is provided above and this is dropped through convenient chutes into the feed alley. The stalls and outer alley are of concrete and a gutter is formed in same at the back of the stalls. This arrangement makes cleaning very easy and that is why this form of barn finds many advocates.

Plenty of windows all around provide an ample amount of sunshine and ventilation; both are so necessary for the well-being of the cattle. Plenty of light, as arranged for in this barn, enables cleaning and the milking to be more easily performed as one can see all operations.



MOTOR TRUCKS

Efficient Methods in their Use and Upkeep

Hauling: When, Why, and How

By PHILIP L. SNIFFIN

MOTOR trucks, varying in numbers and capacities according to the size and scope of the building contractor's business, have come to be indispensable features of the building field. More and more emphasis is continually being placed on the factors of promptness and dependability in transporting materials to the scene of operation.

It is consequently of substantial importance that the contractor consider as specifically as possible the ways and means for accomplishing the most efficient results at a minimum of maintenance and operating cost. The use of motor truck equipment for general hauling purposes seems a relatively simple matter, but there are a good many unique phases which are well worth considering, both because they are keenly interesting to study and because they present many opportunities for reducing costs and for increasing the quality of the service obtained.

Selecting the Right Equipment.

The first consideration is the matter of selecting the proper number of vehicles to allow a maximum of service at a minimum of waste. Largely, a careful selection of equipment involves consideration of the kind and size of motor car installed as well as the type of body best adapted to the builder's requirements. For most purposes in this business, where the problem is one of transporting lumber and material to the building site, a light model car of open type body, satisfactorily answers the purpose. However, where other phases of hauling are involved, such as excavation contracts and hauling heavy or bulky material, the problem is somewhat more involved, since larger and more substantial equipment is frequently needed to handle the work. Here, too, it is especially well to make a careful study of body types, since much time and money can be saved in loading and unloading and in more efficient carrying capacity, if the body is best suited to the work it is to do. There should be a body design to meet each concern's individual requirements, have it made if needed.

Pay Attention to the Motor

At any rate, it is well to consider in buying a motor truck, that the heart of the truck is the motor and for that reason the motor should be given the greatest amount of attention. A truck may have exceptionally good appearance, its construction may be of the strongest and its price may be attractive, but if the motor is inferior or faulty the other points are of little value to the user. In maintaining a motor truck, fully 80 per cent. of the cost of repairs may be traced to the motor. Consequently, the motor is the first determining standard of judgment. "First cost" in installing such equipment is far from being the most important cost.

> THE successful truck purchase is one that renders efficient service per unit of delivery per mile, over a period of years.

Trucks or Horses?

Gradually, but certainly, the delivery phases of the contractor's business are trending more and more toward complete motorization. The reason for this is twofold—greater speed and economy for most general purposes. Furthermore it is true that the motor truck enables the builder to reach an area that it would not be possible for him to reach with horse-drawn equipment. This, of course, is a matter of speed in covering distance and the freedom of the motor car from the somewhat definite limitations of the horse.

Where the horse and wagon is still being used to advantage, it is principally due to limited opportunities for expansion of the builder's business into more distant fields. In fact, there are many cases, usually with a small business, where wagons will answer the purpose at a cost lower than that of motor cars.

A good basis for determining which of the two methods is more economical is that of idle time involved. As pointed out above, a horse and wagon represents an exceedingly smaller investment than does a motor truck, and it is to this fact that its chief advantages are to be traced.

The items of fixed cost, such as interest on the investment and depreciation, being smaller, the cost of idle time is proportionately less. This idle time may be considered either as wasted time of the equipment when it is in the stable, or as standing time during loading and unloading periods.

Therefore, for deliveries particularly on short distances where the time spent for loading and unloading is greater than the actual running time, it is reasonable to assume that horse-drawn equipment is better adapted. Likewise, where delivery demands are unsteady, rising and falling at intervals and where the equipment would be unused for a considerable length of time, it obviously would not pay to invest heavily in motor units.

There are, however, certain advantages to be gained by the use of the motor car when used with a proper understanding of its possibilities. The first and most important of these is its ability to increase the scope of the contractor's business, by extending the delivery radius and taking in new territories, for which work it is more economical, more rapid, and as a whole, more satisfactory than horses.

The above does not mean that the motor truck is only adapted to long distance delivery. In a great many cases, provided there is a minimum of idle time, a light delivery truck will prove more economical than horses or even short delivery. It remains, therefore, for a careful study of the amount of idle time involved, to decide which of the two is adapted to the specific requirements at hand.

It may be said that many successful delivery systems combine both forms, the equipment comprising the maximum number of motor trucks that can be kept continually busy, supplemented by enough horse-drawn units to conveniently take care of shorter hauls and to use in rush seasons.

Systematic Maintenance

It is a surprising fact that few builders realize the economies that are available in motor equipment operation through providing careful, systematic maintenance of the vehicles. Regular inspection and regular attention to minor repairs will save much on the cost of overhaul and major repairs and in addition to this will add greatly to the productive life of each car. In this is included the item of lubrication and other attention, such as the care of the engine, radiator, battery, ignition system, etc.

Many concerns have been known to pay more per year for repair work than for gasoline, and this may be generally attributed to neglect in maintenance. The extra cost involved in better class drivers and proper supervision is considered justified regardless of how many trucks are operated, since the difference is made up in repair cost saving.

It is wise, therefore, for the builder to acquaint himself with the more important fundamentals of truck operation and maintenance so that he will be able to properly supervise the drivers.

Fundamentals in Brief.

From the very broadest viewpoint, it is well to consider in summary, the more important fundamentals of successful motor car operation. The following five points deserve special attention since they represent the summarized experience of contractors who are successfully employing motor truck equipment.

"In estimating the number of trucks necessary, consider average requirements and not maximum requirements, but do not overlook a small surplus which will permit regular overhauling of the entire fleet."

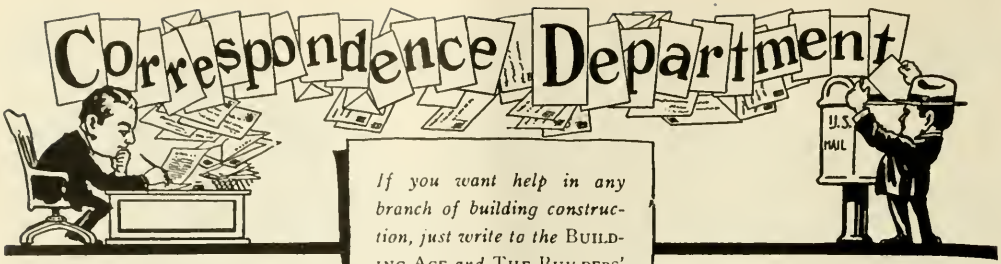
"We select our trucks so that we can use their full tonnage capacity, with weight of goods given first consideration over bulk."

"We let actual conditions govern the use of our trucks rather than set, inflexible rules."

"We use trucks only when they afford greater advantages than any other agency of transportation available for that particular job."

"Always in the employment of trucks, we remember that depreciation, repairs and interest on the investment represent a large share of the cost of truck maintenance. Therefore, we plan constant utilization so that they may work as many hours as possible during their lives."





If you want help in any branch of building construction, just write to the BUILDING AGE *and* THE BUILDERS' JOURNAL *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Kitchen Improvements

I SEE you ask for ways of doing work quicker, easier and better; so I will give a few hints on arranging a kitchen from a woman's standpoint:

The sink was set against a solid wall where the light was no good, making it hard to be sure all dirt, etc., was off the dishes, so I had a window put over the sink and also one to the right with an electric light over the sink.

Now the dishes were set on a board at the end of sink when brought back from the table and, in order to have it clean, it had to be scrubbed with scouring powder three times a day.

I had it covered with zinc which was turned up and fastened on back and side; the corner tilted up and the outside turned down. It was easy to clean, always sweet and no damp sour smell to call flies.

Also got tired of going to pantry each time I wanted a spoon or pot cover so I had a board fastened across side of wall back of stove; I obtained a wire pot cover holder for 20 cents and fastened it up and put all covers in it with large size next the wall and the smaller outside. I could easily get the cover wanted and they were always dry and never rusted.

Next put nails in board so I could hang spoons, strainer and even stewing cups up. It saved lots of steps, they were always dry and handy. Before I would knock down three or four articles trying to find what I wanted.

The kitchen table was too short for me to work at easily, so I had a hinged front fastened to the legs and the top covered with zinc, as it cleaned easily and on which I could set a hot dish right out of the oven, for it did not matter.

I had a cupboard for my kettles and cooking pans under the drain board by the sink and you would be surprised at the amount of work these few conveniences saved me. I think builders should give some attention to these small matters that mean so much to the housewife in her every-day work.—**Miss E. L. Hackett.**

Tree-Shadows on Houses

MAKING the dwelling fit the lot, —or fit the old, native trees one may find upon his property,—is an old story with home-builders, of course! Building a home to take into account the shadow effects produced by one's larger trees, however, is an art which is distinctly new. New though it may be, it certainly has its possibilities. Attest the accompanying photograph of a very attractive Norwood, Ohio, home.

Slip down the first avenue on which this home is located in any season when trees are not in fullest foliage, and you will be amazed at the effects which tree-shadows produce with the immaculate gray concrete walls employed there. Basically, the exterior



house plan is simple. But, when the shadows cast by the big tree near fall longest, one gets a strange effect upon the eye, from this home.

The front corner, the exact angle where fore and sidewalls meet, seems to have been shunted gently outward, bottom foremost. If one could imagine some Colossus taking hold of the corner, where it strikes the earth, and then pulling gently out and away, until the walls,—yielding duly,—formed themselves into a semi-tent shape, one would get perhaps the best notion of what words fail exactly to portray.

Suffice it, people without number, passing in mid-street or cross the avenue, stop in their tracks, surprised at what they see and eager to learn more of the plan of this strange dwelling.

They cross the walk; approach for a nearer glimpse still and find, to their amazement and quite often their chagrin, that the very strange corner-work is an optical illusion alone, and this produced by the shadows cast by the major limbs of a very old tree, rising near.—**Felix J. Koch.**

Bridging

FROM time to time I read articles in yours and other trade papers about wood bridging being omitted and wire or band iron being used in its stead. An article in your August issue is on the use of wire for bridging and to my estimation wire or band iron is not worth the room it takes up. After the timbers are in place one or two years and are thoroughly dried out, the wire will be loose and of no value whatever. It is plain enough to see that where the wooden bridging tightens itself as the timbers shrink, the wire becomes loose and useless. It would be well, I think, to take this matter up in one of your future issues. —**Carl Van Walderveen.**

What has been the experience of other readers of BUILDING AGE and The BUILDERS' JOURNAL with wire or band iron bridging? Let us bring out some of the points for and against its use; we realize there are two sides to the question.—**Editor.**

Modern Weaving Mill Design



Plenty of Daylight Illumination Secured by Means of Large Steel Sash Windows

THIS mill presents a somewhat new departure in the design of weaving mills, especially as to the daylighting of the interior.

Heretofore, saw-tooth roof construction, deemed a necessity to get proper light on the looms, at least in buildings over thirty feet or so in width, has not been adopted. Nor have skylights been used. Flat skylights have never been considered ideal for mills on account of the "hot-house" effect produced by the sun's rays streaming directly into the interior, intensified in power by the skylight glass.

The saw-tooth roof, with the glass section facing north, has been much used for mills and has proved very satisfactory for lighting the interior, but, this type of roof is expensive to build and difficult to maintain in a weatherproof condition on account of the various snow pockets formed.

To get ideal light for the looms, an ideal roof that would cause no trouble, and these at the lowest cost; these factors decided the design in the mill shown herewith.

The building is sixty-four feet wide by one hundred and fifty-eight feet long. It houses ninety-two looms, provides space for the quillers, etc., and leaves ample room for packing. A comfortable office and the toilet rooms are also provided. A handy stock room occupies the mezzanine over the office and toilet rooms.

Taking advantage of the slope of the roof by pitching it toward the south, enabled the steel sash on the north side to extend up to the high point of the roof, thus giving excellent north light well into the interior of the mill, so no skylights were necessary. The sash were glazed with ribbed glass to diffuse the light and eliminate the glare, the ribs also served to carry the light into the interior.

The floor construction of the mill is of cinder fill laid on the ground, concrete bed and a double wood floor laid over sleepers. This gives a dry permanent floor, allows for securely anchoring the looms, and the wood finish floor does not "dust" as does a cement floor. The "dusting" of cement floors means disaster to fast revolving machinery, or high speed equipment of any kind; it eats up the bearings in a very short time.

The looms are driven by individual motors of the A. C. type. This keeps the interior of the mill clean, it is not cluttered with a wilderness of shafting and transmission as results from the old shaft drive system.

This mill was designed by R. C. Hunter & Bro., Architects, of New York and built in Tenafly, New Jersey, for R. M. Burch, and is used for the manufacture of cotton towels.





CARPENTRY

Good Practice in Frame Construction and Finish

Short Cuts to Rafter Bevels

Simple Methods for the Practical Man

By C. A. DONER

OF all the jobs a carpenter is required to do, none are the subject of more written instructions than rafter framing and none less understood.

Books have been published, tools designed and pages of building journals devoted to explaining these seemingly high-brow problems, and after all is said and done, the mind of the average carpenter remains unimproved, not that a practical understanding of rafter framing is beyond his mental range, but because he is obsessed with the impression that the subject is one for only those versed in geometry and higher mathematics. Begging your indulgence, I shall try to present a solution in a more simple form.

Figure 1 shows roof lines as they ordinarily appear upon blue prints.

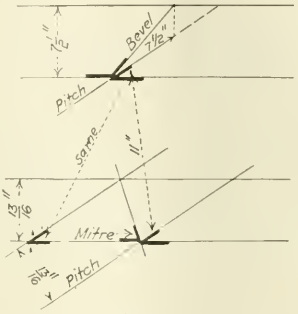


Figure 4

With this data the roof framer proceeds to "cut" this roof.

Figure 2 shows the same with the addition of lines indicating positions and length of runs of all rafters. This is valuable in checking off the pieces as framed. Now observe that the longest run of any common rafter is ten feet, hence a diagram for this portion of the roof will contain all the lengths and bevels in this roof. Accordingly, Figure 3 is submitted, and if it is competently drawn to a scale of one inch to the foot, the actual lengths can be scaled fairly accurately.

Exact lengths can be figured if preferred: If the rise is 6 inches multiply the total feet of run of common or Jack rafter by 13.64 and for hip by 17.93. For 8-inch rise: 14.42 and 18.76. For 10-inch rise: 15.62 and 19.68, and for 12-inch rise 16.97 and 20.78.

This roof being 8-inch rise, the longest common rafter is 12 feet, 1 5 inches and hip 15 feet, 7 3 5 inches. Rafters being spaced 24

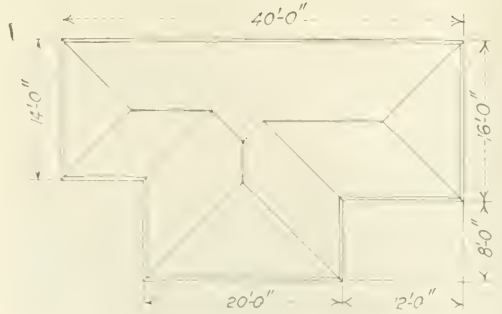


Figure 1

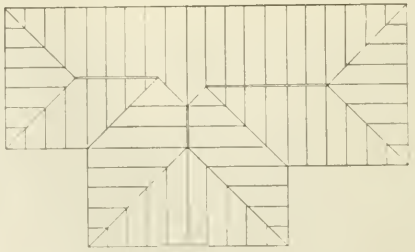


Figure 2

inches on centers their runs diminish 24 inches, hence lengths are shortened successively 2 feet, 4⅞ inches for common and jacks, and 3 feet, 1½ inches for hips and valleys, thus, figure these lengths and work them on the diagram, which now completes a working plan for the whole roof.

This simple method applies successfully to more intricate problems as revealed in the subsequent figures. Figure 4 shows what is perhaps the most simple and expedient way of getting hip cuts for roof boards and hopper lining.

In the case of flower boxes with sloping sides, the dimensions of these are usually within the width of common boards. In this case, it is but necessary to reduce the width of stock to proper width, dress top edge to present a level surface when set up, measure top line on top, bottom line on bottom, connect these uper and lower points for bevel on sides and apply common mitre square for bevel across edge. Any inclined wall with level top is mitred to a square angle with bevel set at one-half pitch, or forty-five degrees.

If a mitre cut is to put on the square edge, draw the lines across edge, same pitch of roof or wall of hopper, these lines separated the width of stock and bisect these lines on opposite corners of edge

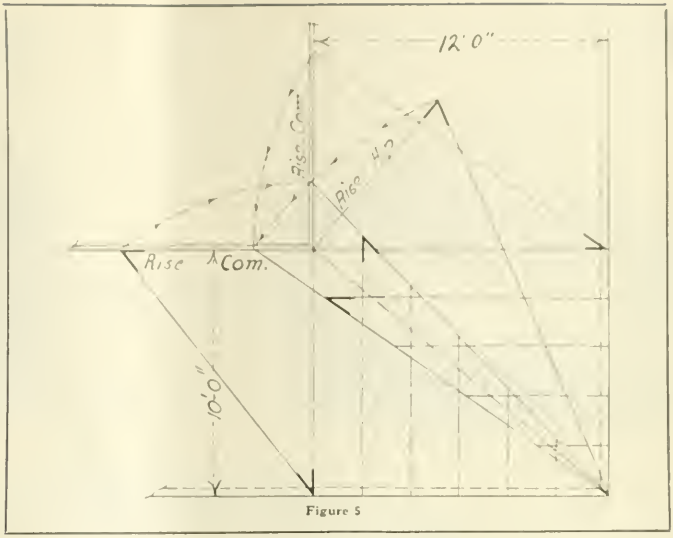


Figure 5

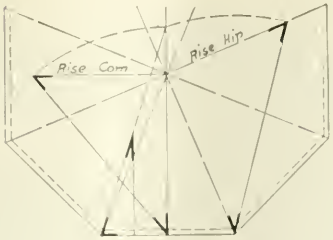


Figure 6

of board, as shown on lower figure. Any bevel or side cut is found by simply working pitch of roof on side of roof board. Measure on this line the width of board 6 inches, 8 inches, 10 inches, as the case may be, and from this point square to opposite side of board and work bevel as shown.

In Figure 5 will be recognized a continuation of the principles elucidated in Figure 3. This is a solution for the intersection of two different pitches. Cuts of roof boards on hip is formed by wall and hip lines as in Figure 3, but the convergence of three lines at this point prevents these bevels being shown.

Figure 6 shows the same treatment applied to an octagon. A block is usually set in the peak to butt rafters against, thus making a square cut. The bevel of jacks is also shown.

Much can be learned by practical experience and this will help to a correct understanding of these principles. Few wall lines are so true that properly cut rafters do not require to be recut at some place on the roof, and by the same token properly cut rafters will prove if the wall is true.

If everything is level and plumb all one would have to do is to lay out the work accurately and cut to the line and it would fit.

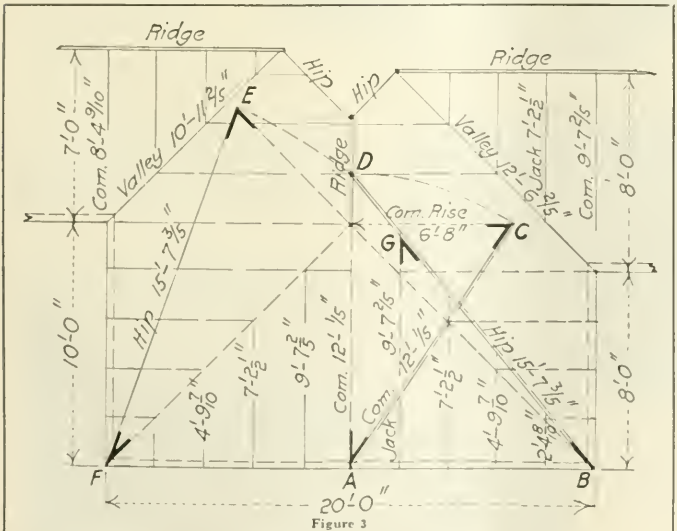


Figure 3

Homes *for* Cars



LEFT—A well-designed, two-car garage of frame construction covered with wood shingles and roof. There are two eight-feet-wide sliding doors.

RIGHT—A brick, two-car garage with an asbestos shingle roof. A four-section accordion sliding door gives a full opening of fourteen feet.



Public garages and service stations are now being made of attractive design. Here is a neat-appearing structure of brick. Ornamental designs have been worked in over the large doors and the other brick work has been laid in



English bond with the stretchers of a darker shade of tapestry brick. The coping is of concrete cast in place and finished in white which contrasts with the red brick and forms a very pleasing and ornamental combination.



Below is shown a novel four-car garage. It is placed in the rear corner of a corner lot. A driveway extends to each street. Built of frame with stucco finish and an asphalt shingle roof giving a neat appearance at but small cost.



Concrete blocks have been used for this convenient six-car garage. Three sets of double sliding doors give easy access to the interior. The roof is well covered with a tile stamped metal shingle which is painted red and harmonizes with the grey of the concrete blocks.

What the Editor Thinks

The General Contractor

FROM time to time, we hear about different schemes for eliminating the general contractor from the job for the sake of economy. It will be found, however, by experience, that while the sum total of separate contracts frequently amount to much less than the lump sum estimated by a general contractor, still the ultimate cost of the structure would far exceed the general contractor's bid.

The trouble is with the co-ordination of the work which the general contractor sees to—without his aid and guiding hand the extras pile up on the owner.

On a good many jobs that have no general contractor the different contractors quite often get into a squabble regarding the work. Each one wants to do his own, irrespective of the others' rights or troubles, and the result is quite often some very expensive extras. We have known of a plastering contractor that was miffed because the plumber did not have the piping completed, so he calmly went on with the plastering, which of course had to be torn out for the plumbing to go in place. Of course, the argument that ensued was not pleasant or profitable for the owner.

Yes, the general contractor is worthy of his profit.

Insecure Framing

IT is an unfortunate fact that many of the frame houses being erected today for more or less speculative purposes, are put up in such a hurry that not enough attention is given to properly securing the joists.

The writer has examined a number of recent buildings in process of construction and has found that trimmer joists are supported by the headers by means of only two nails! In other words, there is less than one-quarter of a square inch in cross sectional area of iron to withstand the shearing stress to which it is subjected. This is certainly an unfortunate state of affairs and is bound to result in a number of these buildings needing costly repairs at no very distant date.

This sort of shoddy construction should not be tolerated, but unfortunately a good deal of this sort of work is going on now in our larger cities where it is supposed adequate and efficient building departments exist.

We sincerely trust that the readers of BUILDING AGE will do all in their power to look after these small but very important structural points that means so much to the lasting qualities of the building and that can be accomplished in but very little additional time.

Our Cover Design

INTERESTING indeed is the view of the house shown on our front cover. This is an excellent example of clever designing.

It shows one of the two family houses planned by Bates & How, architects, of New York and is a portion of the development called "Oak Court Terrace," located at Bronxville, N. Y.

It certainly forms an interesting combination of timber work, stucco, slate and stone, while the casement windows give an added touch of beauty to the whole.

High Wages and Efficiency

MUCH has been written about the high wages paid to building mechanics holding back building progress. This is, in a way, true to a certain extent, but the great trouble is inefficiency. This not only applies to workmen doing the actual work, but to the office and field management as well.

Great progress will be made when we give more attention to better ways of doing work, rather than to more hours and less pay. No community or country can be prosperous unless the great majority of the people are prosperous, that is, earning good pay.

In some of the large corporations the man that is paid $50,000 per year is considered the cheapest man on the payroll. The reason is that he is efficient and is worth the money.

There are surely better and quicker ways of doing work than are now being used and if we put earnest thought and study to these, better progress will be made in cheapening the cost of construction while improving the quality.

We all know that today we are getting better goods and better material at less money than our ancestors, even though wages were so small then, that in our eyes today it would mean starvation. Modern inventions have changed this and the change is coming in the building industry quite rapidly. On even the smallest jobs now, we find in daily use labor saving devices. There are concrete mixers and power hoists, portable saws, etc., on nearly every job. A few years ago it was the ordinary thing for a carpenter to do all ripping by hand saw work on the job—who would think of it today on any fair-sized job? There are many other labor saving schemes that will develop if we would only put on our thinking caps and work efficiently.

Remodelling of Homes

THERE is rather an interesting article on this subject published on another page, several illustrations are given of recent jobs of remodelling that show what has been accomplished in this line.

Modern ideas of living require something better than were provided in the old-fashioned homes and to make these old homes a paying investment to-day, it is necessary to bring them up-to-date.

Builders should study this subject very carefully as this is certainly a very profitable field for work. In many cases the alteration job is small and it is up to the builder to make suggestions and show designs of what can be done.

The builder who is able to do this will be successful in securing many good paying jobs.



Legal Department

CONTRACTING firm asks advice concerning a case where they erected a house according to plans prepared by it for the owner. After the building had been erected and plastered, part of the structure over a large opening between two rooms settled on account of the partitions on the lower floor not being strong enough to carry the overhead load. This threw both floors out of level. The contractors are not licensed architects, but they honestly supposed that the building would be sound. The owner now refuses to pay a balance due under the contract, claiming that due to the contracting firm's fault the house is in bad shape. We are asked whether the balance is recoverable. The owner furnished the materials and there was no written contract. Regular charges for labor were made.

The Builders' Responsibility Concerning Defective Plans Prepared by Him

Reluctantly, the law editor of this journal comes to a conclusion that the firm could not enforce a right of recover in the courts.

We assume that the building did not cost more than $7,500, and that therefore, there has been no violation of the architects' registration law of the State—Illinois. That law (Illinois Laws 1919, p. 218) forbids "any person to practice architecture" without being registered. Section 2 declares that "planning" a building constitutes practicing architecture. The case before us does not seem to fall within the exception provided in Section 3, to the effect that the act shall not be construed to "prevent persons, mechanics or builders from making plans, specifications for or supervising the erection, enlargement or alteration of buildings or any parts thereof to be constructed by themselves or their own employes *for their own use*, provided that the work in drawings for such construction are signed by the authors thereof with a true statement thereon of their relation to such construction and that the makers thereof are not architects." However, it is probable that the case does fall within a further proviso of the law that the act shall not "apply to any building, remodeling or repairing of any building or structure within the corporate limits of any city or village, where the total cost of said building, remodeling or repairing does not exceed the sum of $7,500."

But, if the cost in this case did exceed $7,500, I believe that the contracting firm would be deprived of the right to compensation on the ground that in planning the building they violated the architects' registration statute.

Apart from the act above referred to, I am afraid that in case of a lawsuit to recover the balance claimed on the job there would be grave danger that a judge or jury would find that there was such error in judgment in planning the house as to deprive the firm of right to compensation.

It has been decided by the courts of several States, including those of Illinois (see 9 Corpus Juris, 752), that where an owner furnishes plans and specifications to a contractor for the latter's guidance, the contractor is not liable for defects arising from faulty structural requirements contained in the plans and specifications. This is specially so where the defects are not easily detected. However, there are other decisions holding that even where the contractor does not prepare the plans and executes those prepared by another he is chargeable with defects which are reasonably discoverable or obvious.

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age and The Builders' Journal, 920 Broadway, New York City.

But where a contractor undertakes to furnish plans to be executed by him it seems that he so far holds himself out as an architect as to become subject to the rules of law applying to architects' responsibility for defects in plans. The substance of those rules is that, although an architect is not an absolute guarantor against defects, he is bound to use the care and skill of those ordinarily skilled in the business. If he fails to measure up to this standard and defects develop he becomes liable for resulting damages and loses his right to compensation. And if litigation follows it becomes a question for a judge or jury to determine from all of the evidence adduced whether a reasonable degree of care and skill has been exercised, considering all the circumstances shown.

In this case it appears that the owner furnished his own material. Therefore, if it can be shown that the settling of the building resulted from defects in the material, and without fault on the part of the contractors, that would exonerate them from liability, excepting as the material was such that they should have known that it could not safely be used under the plans.

On a trial the judge would in all probability rule that the settling of the building would raise a presumption of defects in the plan. If so, it would be up to the contractors to show that they used due care and skill in preparing the plans.

It would be a pertinent inquiry in the case as to just what information the owner had concerning the contractors qualifications to plan a building. If they were not well qualified and the owner knew that fact, it would materially strengthen the contractors' case. However, if the owner had no special information on the subject, and the contractors undertook to prepare the plans without disclosing any lack of experience in doing that kind of work, the owner had a right to expect a reasonable degree of architectural skill.

And in filing suit it should be borne in mind that on a close question of fact as to whether there was lack of skill or negligence a judge or jury would be apt to give considerable force to the circum-

stance that defects actually developed in the building—a result not ordinarily to be expected where plans are carefully drawn and executed.

As a practical matter, the only thing these contractors can do is to place their claim in the hands of a good lawyer in their county and let him do the best he can toward securing the best possible settlement.

Breach of Contract Employing Architect

"HAVE furnished plans and specifications for a family dwelling with the verbal agreement that I should supervise the work," writes a Pennsylvania architect. "There was no written agreement, but the owner has accepted the specifications, in which the 'architect's services' are fully described. Now the owner desires to go ahead with the work without my supervision. Please advise me what stand to take in this case."

From this brief statement of the facts of the case it is inferred that the architect has a valid claim for the agreed compensation for his services in preparing the plans and specifications, or the reasonable value, if there was no specific agreement as to rate or amount. It is also inferred that the circumstances are such as to give the architect a valid claim for damages for breach of the agreement to employ him in supervising construction of the building.

We suggest that if a satisfactory adjustment cannot be reached by direct negotiation the claim be placed in the hands of a local attorney, particularly if the architect will remain unemployed for the time that would have been covered by his employment under the broken contract. However, if he has all the work that he can do and can employ himself with substantially the same profit in doing something else, during the time that he would have been employed under this contract, his damages are only nominal. In that case litigation would seem to be undesirable.

Recovery on Bill Exceeding Estimated Cost

CONCERNING its right to recover compensation for constructing a garage under the following stated circumstances, a New York contracting company asks our views:

"In submitting a rough estimate on the building, to have living quarters above, the company informed the owner that it would try to keep the cost within $6,100. No contract was made for this amount, however. Two small jobs had previously been constructed for the owner by the same company at costs running slightly over estimates previously given. Those bills were paid without question.

"Before specifications on the garage were prepared by the company, no architect being employed by the owner, the contracting company mentioned that a saving could be effected by following a local custom of leaving the studding open on the first floor, using dressed timber. The specifications were drawn with this suggestion incorporated.

"In the course of construction, the owner directed several changes to be made, and his directions were carried out. Before the work was completed the owner advised that he understood that the first floor was to be ceiled. He directed that the ceiling be done, stating that settlement of the difficulty would be made later.

"The total cost was kept as low as possible, but, with several extras, including 4,000 sq. ft. of ceiling and painting outside trim, the bill amounted to $7,192.60. The bill has not been paid and we are asked for an opinion as to whether payment could be enforced by suit.

"It is not disclosed what part of the whole bill is fairly apportionable to extras. But, assuming that the work originally contemplated was kept approximately within the estimated cost and that the fact that the total exceeded the original estimate by nearly $1,100 is to be largely accounted for in the extras which the owner ordered, there should be no difficulty in recovering the full amount of the bill.

"The specifications show that the first floor was not to be ceiled, and unless the owner can show that, through mutual mistake or through fraud on the contractor's part, the specifications failed to call for ceiling mutually agreed upon, he is bound by the specifications as drawn.

"But were the case to get into the courts there would be a strong chance that the contractor would be held approximately to his estimate on all work contemplated by that estimate. The facts that no sum was specially agreed upon, that an estimate of $6,100 was given, and that payments on the two previous jobs done by the contractor for the same owner had been made approximately in accordance with estimates, would probably be taken as indicating that the owner was led to understand that the cost of the garage would not materially exceed the rough estimate given, excepting as increased by extras.

"There appears to be plausible ground for an argument that the estimate was only a rough one, permitting variation on the contractor acting in good faith to keep the cost as low as reasonably possible. But he should go into court prepared for a finding by the judge or jury that his estimate constituted an implied guaranty that the cost would not be grossly in excess of $6,100.

"In the New York case of Weibert vs. Hahan, 136 App. Div. 388, 121 N. Y. Supp. 35, it was decided that a statement by a builder that the cost of work would be in the neighborhood of $1,500, but would not exceed that sum, did not constitute a positive agreement to do the work for that sum, but only an approximate estimate.

"No agreement having been made or estimate given as to the extras, the builder is entitled to a reasonable allowance for this work. So, if after deducting this reasonable allowance, the balance does not grossly exceed $6,100 the right to recover the amount of the bill as rendered appears to be clear.

"The subject bears some close analogies to the right of an architect to commission for preparing plans for a building which cannot be constructed within a certain cost limitation, with the essential distinction that a builder's failure to keep within his estimate, approximately, merely limits his compensation to the estimate, approximately, while the architect's right to compensation is wholly lost unless he keeps reasonably close to the cost limitation or unless the owner waives his failure to do so. The law concerning architects has been authoritatively summed up as follows:

"'Where plans are required for a building not to cost more than a certain sum, or are accepted on condition that it can be erected for a given amount, there can be no recovery by the architect unless the building can be erected for the sum named, or unless the increased cost is due to special circumstances, or to a change of plans by direction of the owner. But as this condition is intended for the protection of the owner it may be waived by him by any act which clearly shows such an intention, as where he accepts the plans with the knowledge that the cost of the building will exceed the sum originally proposed.

"'Where an architect submits estimates of the probable cost of the building, he cannot recover for his plans unless the estimate is reasonably near the actual cost.

"'Some of the cases, however, do not apply so strict a rule, but hold that an architect who prepares plans for a building pursuant to the order of the owner that the building shall not exceed a certain cost is entitled to his compensation if the cost is 'reasonably near' the proposed amount, and whether there is a reasonable approximation of the actual cost to the proposed cost is ordinarily a question for the jury, although if the excess is great the court can deal with it as a question of law.'" 5 Corpus Juris, 262.

On a survey of the whole subject, so far as presented, we are of the opinion that the contracting company in this case will have a good chance of recovering the full reasonable value of the work done.



BUSINESS GETTING METHODS

Ideas that have worked for others

Using Plan Books to Obtain Jobs

MANY builders make good use of plan books to aid them in securing building contracts. Nothing that you can show a prospective customer (except the house itself) is as good as a picture and floor plan.

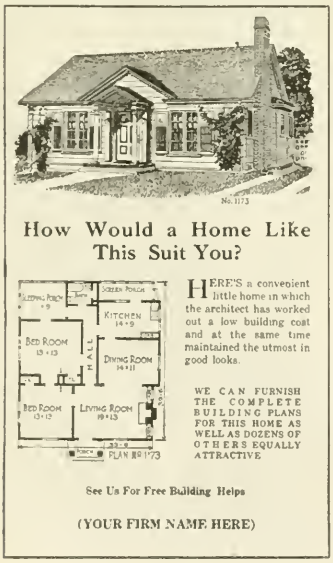
By obtaining a number of these books the building contractor will have on hand a very valuable collection of home designs showing different forms of construction such as wood, (both clapboard and shingle) concrete (including stucco work), hollow tile, common brick, face brick, etc.

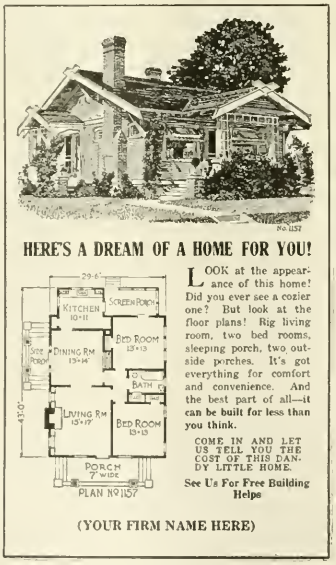
In the majority of cases, blue print plans and specifications of these houses may be obtained at a nominal sum, thus giving one's customers the benefit of the best architectural skill.

An effective way is to advertise in one's local paper and many exceptional advertisements have been prepared along this line. A good step in this direction was recently undertaken by the Southern Pine Association. They prepared a number of advertisements as suggestions for the contractor and lumber dealer to use in their local papers.

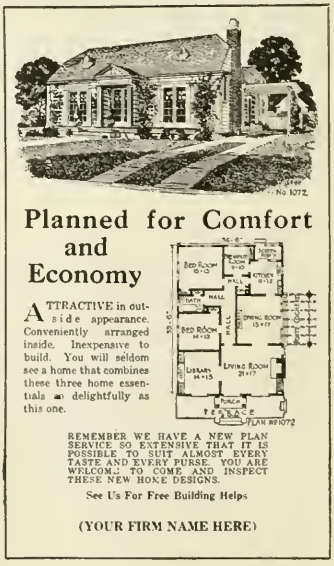
The idea in back of these advertisements is to create the desire for a home. A picture of one of the homes and a small floor plan, short descriptive matter that is terse and to the point, closing up with the line of "see us for free building helps," induces interested parties to call.

When a party is interested enough to inquire about a house and calls on you, then it is the right time to pull out your plan books and show a number of designs that about meet their wants. Being prepared with a collection of useful plans is certainly a big help in obtaining additional house contracts.





Examples of Three Model Advertisements Prepared as Suggestions



Win Good Will



with this simple installation

NATIONAL Garage Door Holder No. 810

Builders are winning favor every day by seizing opportunities to add the little, low-cost, finishing touches that make their structures stand out from the common run.

In garages, where the doors swing on hinges, there is no one item that pleases the customer more than the NATIONAL Garage Door Holder No. 810. **It locks the doors open and prevents injury** to the car when entering or leaving the garage.

Easily installed. Just a pair of rigid steel arms swivelled to fold back along the head jamb when the door is closed; sliding smoothly out and locking into two notches when opened—released by easy pull on chain.

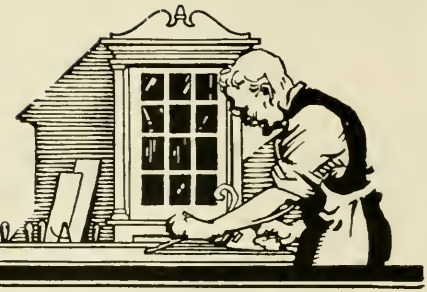
Send for our catalog of Garage Hardware

NATIONAL MANUFACTURING CO.
STERLING ILLINOIS

National

SHOPWORK *and* FURNITURE

Designs for the Finish Man



Stairs *of* Unique Design

HERE is a picture of a stairway that is out of the ordinary in its design. This was built in the California home of Pauline Frederick, the well known movie star. The first four steps leading to the platform are quite wide being seven foot and this makes rather an impressive appearance in a residence. As our picture shows, this platform is wide enough for two doors that open from it. The next twelve steps lead to another platform from which additional steps lead to the second floor level on both sides. Instead of the ordinary balusters and hand rail, a rather wide bulkhead has been used which forms quite an interesting architectural feature of the hall. This bulkhead has been arranged in the form of panels which uniformly extend to the base or string, as the case may be. As shown in our picture, the wide cap of the bulkhead serves as a resting place for ornaments.





Redwood–and the permanent beauty of the white house

BUILDERS know all about the troubles some woods give before you can get even a passably good job of white painting.

When Redwood is specified, the most attractive and long-lasting painting job is assured. There's no pitch in Redwood to "bleed" through, nor hard and soft spots to mar the painter's work. Redwood's uniform texture provides surfaces which take and hold paint well.

Properly dried Redwood—painted, stained or unpainted—does not warp, shrink, swell or decay. It assures both permanence and beauty.

Our Redwood "Construction Digest" and our "Engineering Digest" contain much useful data for architects, builders and engineers, indicating the exceptional suitability of Redwood siding, shingles, trim, columns, mouldings, pickets, balusters, gutters, window and door frames—for all exterior construction work where resistance to decay-producing fungus, boring insects and the ceaseless warfare of the elements demands the most enduring wood.

Our Chicago or New York office will gladly send you these digests and any detailed information you may desire.

Redwood should be specified for

Exterior Construction

Including—Colonial siding, clapboards, shingles, door and window frames—gutters, eaves, water tables and mudsills—porch rail, balusters and columns—mouldings and lattice—pickets and fencing—pergolas and green houses.

Interior Finish

Natural, stained or painted. Wood block floors.

Industrial Uses

Tanks and vats for water, chemicals and oil. Factory roofs and gutters. Wood block flooring.

Redwood should be specified for

Wood Specialties

Such as—Caskets and burial boxes—incubators and ice-cream cabinets—cigar and candy boxes. Furniture manufacturing, etc.

Railroad Uses

Such as—Railroad ties and tunnel timbers—signal wire conduits and water tanks—car siding and roofing.

Farm and Dairy Uses

Such as—Silos, tanks and troughs—hog feeders and implement sheds—wood block floors, etc.

CHICAGO
2070 McCormick Bldg

NEW YORK
832 No. 40 Rector St. Bldg.

THE PACIFIC LUMBER CO. of Illinois

SAN FRANCISCO
311 California St.

LOS ANGELES
Central Bldg. 6th and Main Sts.

THE PACIFIC LUMBER CO.

The Pacific Lumber Co.

Redwood

The Largest Manufacturers and Distributors of California Redwood

"The Western wood for Eastern homes"



PAINTING

Practical Points of Interest to the Builder

Some Notes on Wood Finishing

By A. ASHMUN KELLY

FINISHING the interior woodwork of a house is a matter of considerable importance for its appearance and a few additional hints to supplement the article published in the September issue will no doubt be as helpful.

To give gum wood a figure it is necessary to quarter it; when this is done and the wood is properly stained, you have a very good imitation Circassian walnut. Lots of so-called Circassian walnut furniture is being sold, and bought by the public, that is entirely or partially gum wood.

Of course, to get a perfect imitation one would have to do a lot of work, such as duplicating the figures or lines found in Circassian walnut, using a charcoal crayon and painting in with a pencil and stain. This would not do on cheap work, of course.

As Circassian walnut requires a stain that will not penetrate the surface deeply, the thinning agent used with the stain must be one that evaporates quickly, such as benzol, for instance, though varnish answers very well also. It must be something that will not in any manner affect the markings of the wood.

For finishing Douglas fir and other similar woods natural, apply two coats of raw linseed oil, which should be well rubbed into the wood, and for a flat finish give one coat of the oil as above, one coat of white shellac, and one coat of flat varnish. For a gloss finish give it one coat of raw oil, one coat of white shellac, and two coats of bright, hard varnish. For wax finish, give it one coat of raw linseed oil, two coats of prepared wax, well rubbed in with a cloth, or if for a floor use a weighted brush. If the wood is first to be stained use the stain instead of the oil. On a natural finish or light stain finish don't use orange shellac, as it is too dark.

OIL stains are very effective for some work, as they bring out the grain of the wood so well. In such cases apply a coat of penetrating stain; that is, a stain thinned with a very penetrating medium, such as benzol or turpentine, or even benzine. But benzol is best on all fir woods. After applying this stain wipe it off when it has set, using a soft rag. Often it is necessary to go over the work with a little color, to tone down parts that are too light, or to match darker parts with the light.

After drying for twelve hours apply a coat of white shellac, for light stain, or orange shellac for dark. When all is dry it may be rubbed down with fine steel wool, then dust off, and finish with a coat of rubbing varnish, rubbing off lightly and giving another coat of the rubbing varnish. The finish is with rubbing or polishing varnish, as may be desired, and which can be rubbed to a dull finish with curled hair.

To get a good gloss finish the foregoing varnish is left to stand 48 hours, then it is rubbed with fine pulverized pumice and oil, using a felt pad. Or for a polished finish, rub with powdered pumice stone and oil, using the felt pad, and polishing with powdered rottenstone and oil, with the felt pad as before. You get the best results in a dry atmosphere and at a temperature of about 70 deg.

To finish red cedar, apply a coat of good clear liquid wood filler, and finish with two or three coats of varnish. Rub down each coat but the last with steel wool, and, if desired, polish the last coat with rottenstone and oil. As cedar is easily marred or scratched one needs to handle it with care.

EXTERIOR wood finishing is different, as it must be made to withstand the weather; hence it is a good plan to get oil into the wood; after making the work smooth and clean rub into it plenty of pure boiled linseed oil, some adding a little japan driers, to hasten the drying and also help harden the oil, though boiled oil is a self-drier, driers being added to it in the process of boiling. This oil should fill the wood perfectly full, so that when the varnish is applied none of the liquids from it will escape into the wood. After giving the oil ample time for becoming quite dry apply two coats of good exterior varnish, rubbing the first coat with steel wool to dull its surface, then polishing the last coat of varnish with pulverized pumice stone and oil. If the wood is to be stained, do it first, before the oiling.

FREE—This Book on Wood Finishing



This book is full of practical information on finishing new floors and trim and refinishing old work of this kind. Written by experts—profusely illustrated—contains color charts—gives covering capacities, etc. We will gladly send it free and postpaid to contractors and builders.

Fill Out and Mail This Coupon

S. C. JOHNSON & SON,
Dept. B.A. 10, Racine, Wis.

Please send me, free and postpaid, your book on Wood Finishing.

Name . . . . . .

Address . . . . . .

City and State . . . . . .

I Buy Varnish from . . . . . .

"Made to Walk on"

Johnson's Floor Varnish dries dust-free in two hours and hard over night. It imparts a beautiful, high lustre—has good body—will give long wear—is absolutely water-proof—and will stand all reasonable tests.

Johnson's Floor Varnish is tough, elastic and durable. It gives a beautiful high gloss which will not chip, check, mar, blister or scratch white. Is very pale in color so can be used on the lightest floors and linoleum. Splendid for furniture, woodwork and trim of all kinds. May be rubbed if desired.

Free to Contractors

We will gladly send you a pint of Johnson's Floor Varnish, all charges prepaid, if you will test it in comparison with the brand you are at present using. Write us on your business letterhead—there is no obligation whatever attached to this offer.



JOHNSON'S FLOOR VARNISH

Concrete Mixing

VASTLY important in the economical placing of concrete is the selection of a proper mixer for the work in hand. Builders interested in this problem would do well to obtain the catalog just issued by the American Cement Machine Company, Keokuk, Iowa, which will be sent to any of our readers interested. It is well illustrated with different types of mixers and contains some very valuable data.

Home Decoration

BUILDERS desiring to make a good impression on their customers will turn over the house decorated in effective style. The walls and ceilings can be easily tinted with Muralite which is made in a number of different colors by M. Ewing Fox Company, 240 East 136th Street, New York. Interesting color cards showing all the different tints made by this firm, together with suggestions for combining the color to get effective decorative schemes will be sent to any of our readers.

Home Study

RATHER interesting and valuable is the booklet "How to Read Blue Prints" which will be sent free to any of our readers by the Chicago Technical College, Room 1038, Chicago Tech Building, Chicago, Ill. This also gives description of the different courses on architecture, drafting, superintendence and plan reading. As winter time offers a good period for study, interested readers can find out about home study by writing for information.

Using Steel Lath

FROM the Bostwick Steel Lath Company, Niles, Ohio, comes the interesting "Wall and Ceiling Hand Book." It tells about the use of metal lath in building construction and is certainly well worth while sending for. They also will send an interesting folder entitled "Whooping the Loop."

Switch for Narrow Partitions

BUILDERS are often confronted with the problem of how to have an electric switch put in narrow partition and they will be interested in the new device for this purpose made by the Arrow Electric Company of Hartford, Conn., who will send a descriptive circular describing this useful electrical device to any of our readers. Every builder should be informed about such items even though he has no immediate use for it. It is especially useful where thin metal lumber and lath partitions are used.

Useful Catalogs

ON this page we give short descriptions of some very interesting catalogs, etc., that have just been issued by different manufacturers.

They will be sent free on application to any of our readers who are interested, but should you prefer to write us, give the date of this issue and title of the catalog desired, and we will have them sent to you.

Orienting the House

THE proper placing of a house with relation to the sun's rays is interestingly described in a booklet issued by the American Face Brick Association, 180 North Wells Street, Chicago, Ill. The book is well illustrated and contains a chart of the sun's position at different times of the year so that one can figure out the right position for placing a house. It contains some very valuable information for builders so that they will be able to advise their customers on this important point.

Copper Roofing

INFORMATION on the proper way of laying a copper roof, illustrated by many detailed drawings is given in an interesting book just issued by the Copper and Brass Research Association, 25 Broadway, New York, and a copy will be sent to any of our readers who are interested.

Modern Plumbing Supplies

SELECTING the proper fixtures for bathrooms, kitchens, laundry, garages, factories, schools, etc., is one of the important things that is up to the building contractor. Help in this matter with many practical points can be obtained from the catalog "D" issued by the Bowman Supply & Mfg. Co., 886 Progress Street, Pittsburg, Pa. Besides plumbing supplies, the catalog also describes heating supplies as well and contains much useful data.

Applying Stucco

INTERESTING is the folder describing a hand operated stucco machine which has just been issued by the Master Rule Company, of 841 East 136th Street, New York. This will be of value to contractors who desire to apply a finish coat of stucco in the shortest possible time.

Contractors' Wagons

DUMPING a load quickly is a time saving feature for a contractor's delivery wagon, and a rather interesting folder comes from the Mandt Company, Keokuk, Iowa, describing their steel dump bodies that can be attached to any chassis. It will be of interest to many of our readers and is worth while sending for by any one.

Movable Stairways

TO make use of attic space without giving up the necessary room for a stairway is interestingly described in the illustrated booklet issued by the Bessler Movable Stairway Company, Akron, Ohio. Much valuable data is given on how one can save space in new homes.

Use of Wall Board

FOR many purposes wall board is ideal and its use is interestingly described in a catalog issued by the Upson Company, Lockport, N. Y. This will be sent to any reader together with a sample of Upson Board. They are doing some extensive advertising in magazines of national circulation, calling attention to the use of wall board and this will create a good deal of work for builders.

Southern Pine

YELLOW Pine is largely used in building construction and therefore it is interesting to know what it is and what it may be used for. A handsomely illustrated book on this subject has just been issued by the Southern Pine Association, New Orleans, La., and a copy will be sent to any of our readers. Colored illustrations are given of popular finishes.

Floor Surfacing

RATHER interesting is the circular entitled, "It's Easy to Get Rich," just sent out by the American Floor Surfacing Machine Company, of 521 South St. Clair Street, Toledo, Ohio. This gives a number of testimonial letters from different contractors who have made money by using one of their machines for surfacing floors.

How Lime Is Made

INTERESTING indeed is the book "A Job That Took a Million Years" that has just been issued by The Ohio Hydrate & Supply Company, of Woodville, Ohio. Few people realize what an important part lime plays not only in the building industry but also in our daily life, and this interesting well illustrated book gives some decidedly helpful information and data especially for builders. It is certainly worth while sending for.



City and County Building, Provo, Utah.
Joseph Nelson, Architect.

Keystone Copper Steel used for sheet metal work.

WEAR and *rust-resistance* are qualities of first importance—particularly for sheet metal used for roofing and construction purposes. Keystone Copper Steel means better buildings. *It lasts.*

KEYSTONE
COPPER STEEL

Keystone Copper Steel is an alloy made by the addition of a certain percentage of Copper to well made Steel, thereby greatly increasing its lasting and rust-resisting qualities under actual service conditions. It has been scientifically developed and tested—and its use is strictest economy.

The high reputation of our products is recognized wherever sheet metal is used. Each brand of our manufacture has behind it a service—the scope of which has a tangible value to every architect, contractor and builder. This service begins with the planned care and skill in the making, which is carried through to the thorough system of distribution which keeps these products obtainable in every part of the country. For roofing, siding, gutters, spouting, eaves trough, sheet metal and tin work, use Keystone Copper Steel Galvanized Sheets and Roofing Tin Plates—best for both builder and property owner. Sold by leading metal merchants, and used by the leading contractors.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES

Chicago Cincinnati Denver Detroit New Orleans New York Philadelphia Pittsburgh St. Louis

Export Representatives: United States Steel Products Company, New York City

Pacific Coast Representatives: United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle

Review of Building Situation

BUILDING statistics for August, just published by F. W. Dodge & Company, show that the volume of contracts awarded for the past eight months of this year has either equalled or passed the total for all of last year. The total for August is only a little over 8 per cent. less than that of July.

The Middle West district which has been rather backward, is showing up more strongly and it is to be hoped that this will continue. There is also a healthy sign in this district of the amount of work contemplated.

Residential construction in practically all districts still leads and will continue to do so for many years to come. The demand for houses is still as keen as ever, there is a large fertile field here.

There has been a very noticeable increase in the amount of industrial construction both in contracts awarded and contemplated. A surprisingly large amount is being spent on new factories, etc., in the Pittsburgh district—the immense sum of $39,687,000 has already been awarded for this class of construction so that it is assured that builders in this locality will have plenty of work in this particular line.

Now that the railroad and coal strikes are settled, the delivery of building materials will soon be on a proper basis again. There, of course, will be some delay in certain districts as coal will, properly, have the right of way over every other freight.

It is encouraging to know that a good deal of money is still being spent on new school construction in practically all districts and a good deal of this type of construction is contemplated.

A very good sign of the times is that the figure for August of this year is 46 per cent higher than that of last year. Another good sign is that public works are going forward.

THE deficiency of skilled tradesmen in the building trades has been commented on again and again from one end of the nation to the other, but in spite of the comment, it is still there. The decrease in skilled labor in six various trades of the building industry during the last ten or twelve years is decidedly marked, while other classes of labor showed a decided increase over the same period of time, according to statistics from the United States Census for the whole nation. Covering the period of 1910-1920, structural iron workers show increase of 64.5 per cent; iron and steel laborers, increase 51.2 per cent; paint and varnish factories, increase, 40.8 per cent; elevator tenders (male), increase, 33.4 per cent; brick and stone masons, decrease, 23.6 per cent; electricians, increase, 77.2 per cent; carpenters, increase, 8.6 per cent; general building labor decrease, 28.4 per cent; painters building, decrease, 9.5%.

Record of August, 1922, Building Contracts Awarded

Classifications of Buildings	SECTION OF COUNTRY						
	New England District	New York District	Mid. Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$4,302,800	$11,378,300	$4,968,900	$4,943,800	$11,383,800	$1,144,100	$38,121,700
Educational	2,290,900	9,637,600	4,580,800	5,511,500	9,675,300	359,100	32,055,200
Hospitals and Institutions	309,500	3,533,000	1,338,200	502,000	3,474,000	226,000	9,382,700
Industrial	2,960,900	12,649,000	2,528,400	39,687,700	7,210,500	2,337,000	67,373,500
Military and Naval	70,000	31,000	7,500	300,000	20,000	.....	428,500
Public Buildings	182,700	1,323,400	138,400	773,600	184,400	.....	2,602,500
Public Works and Utilities	3,436,800	5,722,800	5,894,800	15,164,600	19,181,300	424,700	49,825,000
Religious and Memorial	1,100,600	1,247,500	1,423,000	2,032,000	2,880,500	205,000	8,888,600
Residential	12,672,400	28,970,100	14,880,600	14,719,500	27,524,100	2,116,200	100,882,900
Social and Recreational	747,500	6,245,200	638,000	1,771,500	2,848,000	196,000	12,446,200
Total	$28,074,100	$80,737,900	$36,398,600	$85,406,200	$84,381,900	$7,008,100	$322,006,800

Building Projects Contemplated, August, 1922

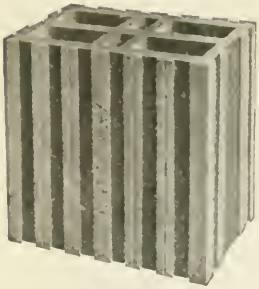
Classifications of Buildings	SECTION OF COUNTRY						
	New England District	New York District	Mid. Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$5,663,600	$14,119,500	$6,250,500	$4,961,100	$20,997,300	$12,228,000	$52,684,100
Educational	3,751,300	6,618,700	4,832,000	2,775,000	7,591,700	8,444,600	26,170,600
Hospitals and Institutions	2,339,000	5,395,500	443,500	2,002,000	3,491,000	3,091,000	13,787,000
Industrial	4,478,900	3,682,000	3,829,700	15,236,500	8,743,000	3,681,200	36,166,100
Military and Naval	10,000	52,000	.....	40,000	118,000	192,000	220,000
Public Buildings	403,600	362,600	225,300	137,000	587,400	6,350,600	1,768,900
Public Works and Utilities	7,241,900	12,642,300	11,904,800	12,873,900	36,008,300	31,094,200	81,051,600
Religious and Memorial	1,374,600	1,203,500	1,805,000	1,498,000	3,452,000	2,122,000	9,419,600
Residential	14,633,200	41,096,900	21,518,500	17,390,000	41,819,600	27,256,600	138,476,600
Social and Recreational	1,339,500	2,037,500	1,485,000	1,270,500	4,271,000	3,132,500	10,504,500
Total	$41,235,600	$87,210,500	$52,294,300	$58,184,000	$127,079,300	$97,592,700	$370,249,000



Home of George A. Soares, Kittaning Pike, Sharpsburg, Pa. Private Plan

Beauty—More Than Skin Deep

THE charm of this attractive home is not entirely visible to the eye. Its fire-proof and sturdy walls of NATCO Hollow Tile with their continuous air cells insulate the interior against the heat of summer and the cold of winter. The elimination of through mortar joints (an exclusive feature of all NATCO Hollow Tile) assures that it will remain perfectly dry within, despite frost, thaw or rain.



NATCO XXX Tile unit showing dovetail method for gripping stucco on exterior and plaster on interior. Note moisture stop at end.

The beauty of NATCO Homes is *wall-deep*. They are as permanent as those constructed of solid masonry because the hard clay of the tile offers more resistance to decay than does stone. Moreover, NATCO Hollow Tile, having every advantage of solid masonry construction, is far more economical. The cost of a NATCO Home is little more than one of frame.

NATCO Hollow Tile is always a profitable investment. It assures satisfaction to the home builder and, therefore, prestige, good will and profit to architect, builder and dealer. NATCO literature covers the needs of all three and will be gladly supplied *free* on request.

NATIONAL·FIRE·PROOFING·COMPANY

1428 Fulton Building, Pittsburgh, Penna.

NATCO HOLLOW TILE

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	Aug. 28	Sept. 28
LONG LEAF YELLOW PINE—		
B. and Better Edge Grain Flooring, 13/16x2½" Face...	$80.00	$83.50
Dimensions, S1S1E, No. 1 Common, 2x4", 10'.....	37.00	37.00
Timbers, Merchantable, '05, 12x12", 10 to 20'.....	53.00	53.00
B. and Better Ceiling, ½x3¼.....	46.50	47.00
B. and Better Partition, ¾"x3¼".....	60.00	63.00
B. and Better Finish, 1x4".....	64.00	67.00
No. 1 Common Boards, 1x8".....	44.00	49.25
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13/16x2½".....	$65.00	$65.00
Roofers, 13/16x5½"	31.50	33.50
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3".....	$75.00	$75.00
No. 1 Clear V. G. Flooring, 1x4".....	73.00	73.00
No. 2 Clear and Better Ceiling, ½x4".....	48.00	53.50
No. 2 Clear and Better Novelty Siding, 1x6".....	52.75	54.00
No. 2 Clear and Better V. G. Stepping.....	89.00	94.00
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M.....	$7.68	$7.68
Washington Perfection Shingles, per M.....	7.42	7.42
Clear Bevel Siding, ½x6".....	52.50	52.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½".....	$8.68	$9.25
Dimension, 2x4", 10 to 16'.....	34.00	34.00
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2x2¼".....	$157.50	$157.50
Clear Plain White Oak, 13/16x2¼".....	113.50	113.50
Clear Plain Red Oak, 13/16x2¼".....	113.50	113.50
Clear Maple, 13/16x2¼".....	103.00	103.00
(All lumber prices furnished by National Lumber Merchant)		
COMMON BRICK—		
Per M. f. o. b. job.....	$24.00	$20.60
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered.....	$2.45	$2.90
STRUCTURAL STEEL (IRON AGE)—		
Per 100 lb. to large buyers.....	$2.24	$2.34
CRUSHED STONE (cu. yd.)—		
¾ in.	$2.75	$2.85
1½ in.	2.60	2.70
WALL BOARD—		
Per 1,000 sq. ft. in lots under 1,000 sq. ft.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.....	45.00	45.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered.....	$18.00	$20.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered.	20.00	22.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	22.00	22.00
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag.....	$0.60	$0.60
Masons, per 50 lb. bag.....	.49	.45
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.55	$1.65
¾ in. Gravel (per cubic yard).....	2.75	2.85
1½ in. Gravel (per cubic yard).....	2.75	2.85
FACE BRICK—		
Tapestry (deliverred)	$46.00	$46.00
Caledonian (delivered)	43.00	43.00
Smooth Grey (delivered).....	47.00	47.00
Fiek Lock f. o. b. factory.....	36.00	36.00
SHINGLES—		
Asphalt, Single (per square).....	$8.25	$8.25
Asphalt, Strip (per square).....	6.50	6.50
STAINED WOOD SHINGLES—		
16 in. Extra Clear (per square, delivered).....	$11.00	$11.00
18 in. Eureka (per square, delivered).....	11.00	11.00
18 in. Perfection (per square, deliverred).....	12.00	12.00
24 in. Royal (per square, delivered).....	12.25	12.25
24 in. Imperial (per square, delivered).....	12.50	12.50
VITRIFIED SEWER PIPE—		
4 in. (cents per foot).....	$0.11½	$0.12
6 in. (cents per foot).....	.17¼	.18
SLATE ROOFING—		
Bangor or Slatington, 8x16 in. (per sq. at quarry)...	$8.40	$8.40
CORNER BEADS (Galvanized)—		
Per Foot	$0.03½	$0.06
WALL TIES (Galvanized)—		
Per Thousand	$5.00	$5.00
FLUE LINING—		
8½ x 8½ in. Per Foot.....	$0.33	$0.30
8½ x 13 in., Per Foot.....	.50	.47
HOLLOW TILE—		
8 x 12 x 12 in., hravy. Each, delivered.....	$0.22⅛	$0.27
HAIR—		
Per Bushel	$0.60	$0.60
PLASTER BOARD—		
32 x 36 x ¾ in., Each.....	$0.22	$0.30
MAGNESITE STUCCO—		
Per Ton	$76.00	$65.00
TILE—		
1 in. Square or Hexagon, White, per sq. ft.....	$0.25	$0.25
3 x 6 in. White Wall.....	.60	.60
8 x 8 in. Red Floor.....	.45	.45

CHICAGO PRICES

	Aug. 28	Sept 28
YELLOW PINE—		
Boards, 1x8, No. 1 Com.....	$44.00	$43.00
Ceiling, ½x4, B. and Btr.....	48.00	50.00
Dimension No. 1, 2x4, 12 to 14 ft.....	40.00	40.00
Drop Siding, 1x6, B. and Btr.....	52.00	57.00
Finish, 1x4, B. and Btr.....	62.00	64.00
Flooring, B. and Btr. E. G., 1x3.....	78.00	80.00
Lath, 4 ft., No. 1.....	7.75	8.00
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	46.00	44.00
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear.....	$99.75	$99.75
Oak Flooring, ¾x2, Cl. Pl., White.....	74.00	74.00
Oak Flooring, 13/16x2¼, Cl. Pl., White.....	106.50	108.50
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear.....	$42.25	$42.25
Finish, S2S or S4S, 1x6 to 8 in. clear.....	91.50	91.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear.....	$53.00	$53.00
Shingles, Extra Clears, 16 in.....	5.87	5.41
COMMON BRICK—		
Per M. f. o. b. job.....	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.05	$2.20
STRUCTURAL STEEL—		
Per 100 lbs. to large buyers.....	$2.24	$2.34
CRUSHED STONE (cu. yd.)—		
¾ in.	$3.00	$3.50
1½ in.	3.00	3.50
WALL BOARD—		
Per 1,000 sq. ft. in lots under M.....	$45.00	$45.00
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	50.00	50.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$3.00	$3.50
¾ in. Gravel (per cubic yard).....	3.00	3.50
1½ in. Gravel (per cubic yard).....	3.00	3.50

ST. LOUIS PRICES

YELLOW PINE—		
Boards, No. 1 Com., 1x4.....	$37.50	$47.00
Partition, ¾x3¼, B. and Btr.....	56.00	57.25
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	36.00	37.00
Finish, S2S, B. and Btr., 1x4, 6 & 8 ft.....	63.00	63.00
Flooring, B. and Btr., E. G., 1x3.....	76.00	79.00
Flooring, B. and Btr., F. G,. 1x3.....	61.00	62.50
Lath, 4 ft., No. 1.....	6.80	7.75
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	43.00	39.50
CALIFORNIA REDWOOD—		
Finish, S2S, Cl., 1x6 in.....	$91.50	$91.50
Siding, 4 in. Bevel, 10 to 20 ft.....	44.00	48.00
8 inch Colonial	70.75	70.75
8 inch Bungalow.....	70.75	70.75
HARDWOODS—		
Oak Flooring, ¾x1½ and 2 in., Clear Qtr. White.....	$106.50	$106.50
Maple Flooring, 13/16x2¼ in., Clear.....	91.00	91.00
RED CEDAR—		
Siding, ½x6, Clear	$46.00	$48.00
Shingles, Clears, Per M.....	5.61	5.51
COMMON BRICK—		
Per M., f. o. b. job.....	$17.00	$17.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.10	$2.35
STRUCTURAL STEEL—		
Per 100 pounds to large buyers.....	$2.33	$2.43
CRUSHED STONE (cu. yd.)		
¾ in.	$1.83	$1.83
1½ in.	1.83	1.83
WALL BOARD—		
Per 1,000 sq. ft. in lots under M.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	45.00	45.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.10	$1.10
¾ in. Gravel (per cubic yard).....	1.30	1.30
1½ in. Gravel (per cubic yard).....	1.25	1.25

ATKINS
SILVER STEEL SAWS



WHAT STYLE SAW DO YOU PREFER?

We have a saw to meet every demand, Hand, Rip and Panel Saws, Straight or Skew Back, Wide or Ship Point, Improved Perfection or Old Style Handles.

If you are not familiar with the high quality of

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go to your hardware dealer and have him show you an Atkins Saw — convince yourself that they are

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Send twenty-five cents for carpenter's apron, pencil and Saw Sense booklet.

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Minneapolis	San Francisco	Vancouver, B.C.

Selected List of Manufacturers' Literature

FOR THE SERVICE OF BUILDERS, CONTRACTORS, ARCHITECTS AND ENGINEERS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to BUILDING AGE & THE BUILDERS' JOURNAL, 920 Broadway, New York, or the manufacturer direct, in which case kindly mention this publication. Either the titles or the numbers may be used in ordering.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

(See also Alphabetical Index, Page 116)

ARCHITECTS' SPECIFICATION HAND BOOK

Truscon Company, Detroit, Mich.

170. 52-page paper-bound, loose-leaf specification book. 8½ x 11 in.

ASBESTOS PRODUCTS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

1. *Ambler Asbestos Shingles.* Catalog 5½ x 8½ in. 40 pp. Illus.
2. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog, 8½ x 11 in. 36 pp. Standard Purlin Spacing Tables.
3. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog, 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
4. *Ambler Asbestos Building Lumber.* Catalog, 8½ x 11 in. 32 pp.
5. *Engineers' Data Sheets.* Catalog, 8½ x 11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbeatos Corrugated Roofing and Siding.

ASBESTOS ROOFING—See also Roofing

ASH HOISTS—See also Hoists

ASH RECEIVERS

Sharp Rotary Ash Receiver Corporation, 396 Bridge St., Springfield, Mass.

7. *Catalog E.* Booklet describing the Sharp Rotary Ash Receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6 x 9¼ in.
8. *Catalog F.* A book for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with stables of dimensions for installation. 8 pp. Illus.

BALANCES, SASH

Caldwell Mfg. Company, The, Rochester, N. Y.

9. *Suggestions for the Present-Day Architect.* Booklet, 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.

Pullman Mfg. Co., Rochester, N. Y.

10. *Catalog* describes new form of sasb balance that can be removed and inserted without removing sash from window.

BAND SAWS

American Saw Mill Machinery Co., Hackettstown, N. J.

11. *Catalog No. 22* describing a general line of band saws of various sizes.
12. *Technical Data.* Four-page folder, 8½ x 11 in. containing specifications, description, prices and approximate cost of installation. Everything the architect or contractor requires.

Crescent Machine Co., Leetonia, Ohio.

241. Descriptive 144-page Catalog.

BAR BENDERS AND CUTTERS

Koehring Company, Milwaukee, Wis.

13. *Four-page folder,* giving illustrations and sizes of Koehring Bar Benders and Cutters.

BATHROOM FIXTURES

Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.

401. *Send for illustrated Folder,* "A Bath a Day Keeps You Fit Every Way."

BEDS

Murphy Door Bed Company, Majestic Bldg., Chicago, Ill.

402. *Eight-page illustrated,* "How to Use the Murphy Bed."

BOILERS—See Heating Equipment

BOOKS

American Technical Society, 58th and Drexel Blvd., Chicago, Ill.

Architectural House Planning Service Co., 20 So. 18th Street, Philadelphia, Pa.

Arrow Book Company, 347 Fifth Avenue, New York City.

Chicago Technical College, 1038 Chicago Tech. Bldg., Chicago, Ill

U. P. C. Book Co., 243 West 39th Street, New York City.

BLUE PRINTS

Peerless Blue Print Co., 347 Fifth Avenue, New York City.

403. *Splendid Drawing Board Outfits* are manufactured in conjunction with the making of blue prints.

BRICK

American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.

15. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Sent free.
16. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions are illustrated and described. Size 8½ x 11 in. 116 pp. Price $1.00.
17. *The Home of Beauty.* A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8 x 10 in. 72 pp. Price 50 cents.
18. *Architectural Details in Brickwork.* Three series of beautiful half-tone prints of brickwork detail, contained in closed folders suitable for standard vertical letter file. The three series contain 124 prints in all. Size 8½ x 11 in. Price $1.50 per set.

Common Brick Manufacturers' Association of America, 1309 Schofield Bldg., Cleveland, Ohio.

19. *Brick—How to Build and Estimate.* 3rd edition, 32nd thousand, a manual of solid brick and Ideal wall construction. Contains data on the strength of brickwork, on mortars, bonds and joints and equipment, and contains complete estimating tables for quantities of brick, mortar, material and approximate mechanics' time for various thicknesses and square foot areas of solid and Ideal wall. 8½ x 11 in. 72 pp. Price 25 cents.
20. *Brick for the Average Man's Home.* Book, 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00.

Fiske & Company, Boston, Mass.

245. Tapestry brick, other grades of front brick. Manufacturers of "Fisklock" Brick.

BUILDING CONSTRUCTION—See also Garage Construction

National Manufacturing Co., Sterling, Ill.

404. *An 80-page catalog,* profusely illustrated with various kinds of Garage Hardware.

Truscon Steel Company, Youngstown, Ohio.

21. *Truscon Floortype Construction.* Form D-352. Contains complete data and illustrations of Floortype installations. 16 pp. Ill. 8½ x 11 in.
22. *Truscon Standard Buildings.* Form D-398. Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8½ x 11 in.
23. *Truscon Building Products.* Form D-376. Contains a brief description of each of the Truscon Products. 112 pp. Ill.
24. *Modern School Construction.* Form D-395. Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill.

BUILDING HARDWARE—See Hardware

BUILDING STONE—See Stone, Building

BUILT-IN CLOTHES HANGERS

Knape & Vogt, Grand Rapids, Mich.

405- 16-*page booklet,* describing the "Garment Care System."

BUILT-IN KITCHENS

Bisk Corporation, Brockton, Mass.

406. 16-*page illustrated catalog,* giving the pictures and plans on the installation of the Built-In Kitchens. It describes in detail the various types and sizes.

BUNGALOW AND SMALL HOUSE PLANS

American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.

25. *Four booklets* of small houses from 3 to 8 rooms, containing 98 reversible designs. (1) 3-4 rooms, (2) 5 rooms, (3) 6 rooms, (4) 7-8 rooms; size 8½ x 11 in. Each booklet 25 cents, set $1.

Architectural House Planning Service Company, 20 South 18th Street, Philadelphia, Pa.

CANVAS—See Roofing Materials

CASEMENTS—See Doors and Windows

CAULKING AND GLAZING COMPOUND

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.

246. Illustrated catalog sent on request.

CEILINGS, METAL

The Edwards Manufacturing Company, Cincinnati, O.

33. *Pamphlet* of 32 pages, describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 in.

Keighley Mfg. Co., 124 Third Avenue, Pittsburgh, Pa.

407. *Catalog "M"* describes the Lock Joint Metal Ceiling.

CEMENT

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

37. *The Atlas Book on Concrete Construction.* A text book written for the average builder in concrete and from the practical rather than from the technical standpoint. Treats on both plain and reinforced concrete. 144 pp. 4½ x 7 in. Cloth bound. Price $2.00.
30. *Set of Blue Prints.* Drawings showing how to apply Portland Cement stucco to the different standard types of wall construction. Appended are tables of the quantities of cement and sand required to cover a given wall surface.
31. *Concrete on the Farm.* The most comprehensive book of its kind. Practical and thoroughly reliable instructions, with plans and pictures of all possible farm structures for which concrete can be used. Complete directions in practical terms for selection of aggregates and the mixing and placing of concrete.
32. *Other Publications.* The Atlas Portland Cement Company has numerous other publications, covering nearly every phase of concrete construction. Their Service Department will give sound advice on any phase of concrete construction to anyone applying for it.

Koehring Company, Milwaukee, Wis.

38. *Concrete—Its Manufacture and Use.* Book, 4½ x 7 in. Illustrated. 207 pp. Comprehensive discussion from the practical standpoint of concrete.

CHAINS

Bridgeport Chain Co., Bridgeport, Conn.

29. *Catalog No. 14.* Contains 64 pp. Illustrated, of different chains that can be used in all parts of building construction.

Ideal Wall Withstands Rainy Season

Every day new and interesting facts about the success of Ideal Wall construction come to light.

Here's an extract from a letter by the Nance Construction Company of Los Angeles, California.

> "All of the houses which we have built using the Ideal System stood the rainy season perfectly, not one complaint from moisture coming through the wall. It may also interest you to know that we have now under construction a $35,000.00 residence using the 12 inch hollow wall, which is receiving favorable comment from builders who have seen it."

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A practical test to determine the degree of imperviousness of the Ideal Wall was made at Williamson Trade School, Delaware County, Pa., under the direction of Prof. Jos. Shisler in charge of the Masonry Department.

An Ideal Wall (8" thick) plastered on the inside surface $\frac{3}{8}$" thick with 1:3 lime and sand mortar and finished with $\frac{1}{8}$" hard white coat of calcined plaster and lime paste was subjected to a continuous running sheet of water. Measured showed 28 gallons per hour per square foot of wall surface.

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The headers had conducted water only one-half their length. When the plaster on the inside surface of the wall was removed it showed no evidence of moisture.

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Ideal Wall Industrial Bldg., Laurel, Miss.
L. W. Duffee, Architect

IDEAL Wall is gaining more rapidly than any other type of construction in the big building boom. No new form of construction has ever caught the contractor's attention to the extent of the Ideal Wall.

Why ?

Ideal Wall saves—

- $\frac{1}{3}$ the Brick
- $\frac{1}{2}$ the Mortar
- $\frac{1}{4}$ the Labor
- Furring and Lathing

What a boon to builders—especially when materials are scarce and labor is high.



The Common Brick Industry *of* America
2133 CLEVELAND DISCOUNT BUILDING
Cleveland, Ohio

The Ideal Brick Hollow Wall is made of standard brick obtainable everywhere

Ideal Brick Hollow Wall

"Brick Homes at the Cost of Frame"

(Continued from page 70)

CLAMPS
James L. Taylor Mfg. Co., Poughkeepsie, N. Y.
408. *Descriptive catalog* of the various Clamps.

COAL CHUTES
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.
409. *An interesting folder*, describing the advantages of the Donley Coal Chute.

COLUMN AND BEAM COVERING
United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
39. *32-page booklet*, 8½ x 11. Pyrobar Tile.

COLUMNS
Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.
233. *Catalog No. D-47.* 48 pages, illustrated. 7¼x10 in. Illustrating the Koll's Patent Lock-Joint Wood Columns.

CONCRETE APPLIANCES
Universal Cement Mould Co., No. Milwaukee, Wis.
41. *Illustrated Folder* describing mold for building hollow concrete walls for homes, garages, barns, silos, etc.
Van Guilder Double Wall Co., 77 South Avenue, Rochester, N. Y.
42. *A Catalog* describing the Van Guilder system of portable forms for the building of hollow concrete walls on the thermos bottle idea for the erection of homes, ice houses, barns, silos, etc. Walls are dry, as there is continuous air space around entire building.

CONCRETE MACHINERY
A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
43. *Descriptive Illustrated Circular* of Magic Concrete Mixer.
The American Cement Machine Co., Inc., Keokuk, Iowa.
410. *An interesting 68-page illustrated catalog*, describing the "Boss" Labor Saving Construction Machinery.
Concrete Equipment Co., 535 Ottawa Street, Holland, Mich.
411. *Catalog No. 22* describes in detail the various products manufactured by this company.
Concrete Block Machine & Mold Co., 114 S. 2nd St., St. Louis, Mo.
255. *Catalogue No. 38.* Describes Building Block Machines. It is a 40-page book, 6 x 10 in.
C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
412. *Bulletin No. 1* describes the Portable Saw Rigs.
413. *Bulletin No. 2* describes the Power Driven Pumps, Centrifugal, Pistons, Diaphragm, Triplex.
414. *Bulletin No. 3* describes the Hoists, Mortar Mixers, Material Elevators, Engines.
415. *Bulletin No. 4* describes the Tractor.
Ideal Concrete Machinery Co., 1334 Monmouth Street, Cincinnati, Ohio.
416. *A 100-page illustrated catalog*, describing the Ideal Machine and also data for manufacturing and curing Ideal Concrete Blocks.
417. *Catalog No. 37* describes the Ideal-Cincinnatus Batch-Mixers.
Jaeger Machine Co., 216 Dublin Avenue, Columbus, Ohio.
418. *A 40-page catalog*, well illustrated, describing the special features of a Jaeger Mixer.
419. *16-page folder*, illustrating a Jaeger for every mixer need.
Koehring Co., Milwaukee, Wis.
46. *Koehring Construction Mixers.* Booklet. 7¾ x 10½ in. Illustrated. 96 pp. Complete information on construction type concrete mixers.
47. *Koehring Dandie Mixer.* Booklet, 6 x 9 in. Illustrated. 24 pp. Illustrating and describing Koehring line of Dandie light mixers.
265. *"Built to Endure."* A beautifully bound booklet of 36 pages, 7¾ x 10 in., describing Comparative Examples of Notable Ancient and Modern Construction Embodying the Element of Permanency.
Little Whirlwind Mixer Co., 438 Gould Street, La Crosse, Wis.
420. *An eight-page illustrated folder*, describing the efficiency of the Master Mixer.
Republic Iron Works, Box 602, Tecumseh, Mich.
421. *An eight-page illustrated pamphlet*, describing the Republic "Ten."
Standard Scale & Supply Co., 1631 Liberty Ave., Pittsburgh, Pa.
422. *28-page illustrated catalog*, describing quick, efficient and money-saving concrete mixing.

CONCRETE MARBLE
Art Stone Co., Waynesboro, Pa.
45. *Descriptive Circulars* with illustrations of different marbles in colors. Sent free to any interested party.

CONSTRUCTION, FIREPROOF
Central Steel Co., Massillon, Ohio.
423. *In the "National Steel Lumber" Handbook* is embodied complete information and authentic data pertaining to the use of Steel Lumber Sections and kindred materials.
424. *"National" Bulletin No. 19B* describes the National Shelby.
National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
226. *Standard Fire Proofing Bulletin* 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fireproof floor construction.
United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
48. *Pyrobar Gypsum Tile.* Booklet, 8½ x 11 in. 32 pp. Illustrated. Detail and specifications for fireproof partitions.
49. *Bulletins*, 8½ x 11 in. Containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

CONTRACT AND ESTIMATE BLANKS
L. Fink & Sons Printing Co., Laurel Spring, N. J.
166. *Samples* of contract sheets, estimate blanks, job tickets, time tickets, time sheets, wage receipts, etc., with prices.

CRYSTALS, MICASPAR
Crown Point Spar Co., 101 Park Avenue, New York.
276. *50-page descriptive catalog*, describing the advantages and uses of the Sparkling Micaspar Crystals.

DAMPERS AND ASH DUMPS (Fireplace)
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

DAMP-PROOFING
Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.
425. *Six-page folder*, describing the Nu-Tile 4-in-1 Shingle.
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
426. *Send for catalog* on the advantages of the Asbestos Shingle.
Illinois Zinc Co., 280 Broadway, New York.
427. *Booklet* describing the Zinc Shingle.
Keuffel & Esser Co., Hoboken, N. J.
428. *An eight-page folder*, describing the roof that is always new.
National Sheet Metal Roofing Co., 339 Grand St., Jersey City, N. J.
429. *68-page book*, illustrating the "Shingles That Last."
Rocbond Co., Van Wert, Ohio.
430. *An eight-page folder*, entitled, "Fortifies Your Home Against the Element of Time."
F. C. Sheldon Slate Co., Granville, N. Y.
431. *A 16-page illustrated booklet*, describing "The Most Enduring and the Most Attractive Roof at the Most Reasonable Cost."

DOOR CHECKS
Park Manufacturing Co., Worcester, Mass.
50. *Catalog* contains description of six models of the new improved Worcester-Blount Door Check.

DOORS AND WINDOWS
The Bogert & Carlough Co., 30 Peach St., Paterson, N. J.
247. BOCA steel sash. (E-22). A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.
Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.
432. *A 32-page catalog*, describing "Window Walls," their cost and their advantages.
Henry Hope & Sons, 103 Park Ave., New York.
51. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¾ x 18½ in. 32 pp.
Truscon Steel Company, Youngstown, Ohio.
52. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.
53. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill.

DOOR AND WINDOW FRAMES
Andersen Lumber Company, South Stillwater, Minn.
55. *General Catalog* for architects, contractors, engineers, carpenters or builders. Describes and illustrates fully Andersen Standard White Pine Window, Cellar Frames, Sash Frames and Door Frames. Gives details of construction, variety of sizes and uses for ordinary as well as special construction, and method of assembly. Size 7¾ x 10¾, 24 pages.
56. *Better Frames for Less Money* for consumers. Interesting folder showing advantages of Andersen Standard White Pine Frames. Uses, sizes and details of construction.

DRAFTING MATERIALS
A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
433. *A 116-page book*, describing the advantages of "Direct-by-Mail" Buying.
Keuffel & Esser Co., Hoboken, N. J.
434. *A 486-page Bound Book.* This is the thirty-sixth edition of the catalog.
Peerless Blue Print Co., 347 Fifth Avenue, New York City.
Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.
435. *36-page booklet*, describing the "Sterling" Transits and Levels.

DUMBWAITERS
Kimball Bros. Co., 1106 Ninth Street, Council Bluff, Iowa.
436. *30-page illustrated catalog*, describing the various models of Dumbwaiters.
Sedgwick Machine Works, 156 W. 15th Street, New York.
57. High grade Hand Power Elevators and Dumbwaiters for All Purposes. Illustrated catalog, 52 pages; dumbwaiter service sheet, and pamphlets descriptive of many special types of outfits.

ELECTRICAL DEVICES
Arrow Electric Co., Hartford, Conn.

ELECTRIC METER BOXES
The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

ELEVATORS
Kimball Brothers Company, Council Bluffs, Iowa.
58. *Kimball Elevators.* An illustrated catalog of hand power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7¾ x 10¾ in.
Richards-Wilcox Mfg. Co., Aurora, Ill.
59. *"Ideal" Elevator Door Equipment.* Catalog showing elevator door hangers for one, two or three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.
Sedgwick Machine Works, 156 West 15th Street, New York.

ENGINES—GASOLINE
New-Way Motor Co., Lansing, Mich.
437. *Write for helps and suggestions.*

FACTORY EQUIPMENT
The Edwards Mfg. Co., Cincinnati, Ohio.
60. *Edwards' Steel Equipment.* Illustrated catalog. Showing steel lockers and shelving for factories, offices, stores, schools and hospitals, together with illustrations and description of "Edmanco" steel office furniture and filing cabinets. Size 8 x 11 in. 32 pp.

FIREPLACES AND MANTELS
Apex Fireplace Co., Urbana, Ill.
503. *An interesting four-page folder* with blue prints attached.
King Mantel & Fireplace Co., Knoxville, Tenn.
Strait & Richards, Inc., Newark, N. J.
62. *Catalog* describing fireplaces, electric and gas lags, heatings supplies, heaters, etc.

FLOOR HARDENERS
Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
61. *Agatex and Its Performances.* Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FLOORING LUMBER
The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
63. *The Perfect Floor.* Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5½ x 7¾ in.
Oak Flooring Advertising Bureau, 1014 Ashland Block, Chicago, Ill.

From Colonial Times



A Revolutionary Dwelling at Germantown, Pa.

IN rambles through the older communities it is interesting to note the excellent condition of Copper after a century or more of service.

This Revolutionary dwelling at Germantown, Pa., for instance, has Copper downspouts which present residents say have been in use since the house was constructed, a century and a half ago.

A Copper roof, Copper flashings, Copper leaders and gutters—any Brass or Copper work—may confidently be expected to last as long as the building stands.

Brass pipe plumbing is another important field in which the Everlasting Metal has a distinct and growing usefulness.



Copper leader-head erected in 1785



Galvanized iron leader-head erected in 1918

"Copper and Brass are Cheaper because you pay for them only ONCE"

COPPER & BRASS
RESEARCH ASSOCIATION
25 Broadway - New York

(*Continued from page 72*)

64. *Modern Oak Floors.* Booklet. 6½ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
65. *Oak Flooring, How and Where to Use It.* Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.
257. *Oak Flooring for Factories and Warehouses.* Booklet. 3½ x 6 in. 16 pp. Illustrated. Small general book featuring No. 2 Common Oak Flooring for hard usage in factories and warehouses, with testimonials.

Pacific Lumber Co., 2070 McCormick Bldg., Chicago, Ill.

438. *A sixteen-page treatise* on the construction Digest of Information on the Values and Uses of Redwood.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

66. *Gypsum Powred, Steel Reinforced.* Loose-leaf bulletins, 8½x11. Pyrofill.

Wood Mosaic Co., New Albany, Ind.

227. *Catalogue* of wood-carpet, strips, plain and ornamental parquetry, tongue and groove flooring in natural wood colors.

FLOORING COMPOSITION

Everlasbestos Flooring Co., Rochester, N. Y.

439. *Sixteen-page illustrated booklet,* describing the really modern floor.

FLOOR SURFACING

Amer. Floor Surfacing Machine Co., 521 So. St. Clair Street, Toledo, Ohio.

440. *An eight-page illustroted booklet,* describing the "American Universal." Also opportunities of making money in the "American Universal Way."

Wayvell Chappell & Co., 137 No. Jackson Street, Waukegan, Ill.

441. *Four-page folder,* describing the "Little-Automatic Electric Surfacing Machine."

M. L. Schlueter, 223 W. Illinois Street, Chicago, Ill.

442. *Eight-page illustrated folder,* the various "Improved Schleuter" Floor Surfacing Machines.

FLOOR VOIDS FOR USE IN CONCRETE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

67. *Loose-leaf Bulletins.* 8½ x 11. Pyrobar Gypsum Floor Tile.

FURNACES—See Heating Equipment

GARAGE CONSTRUCTION

McKinney Mfg. Co., Pittsburgh, Pa.

283. *Interesting* 16-*page Catalog,* describing the complete hardware for various types of Garage Doors.

National Mfg. Co., Sterling, Ill.

248. Catalog of Garage Hardware.

GARBAGE DESTROYERS

Kerner Incinerator Company, 1027 Chestnut St., Milwaukee, Wis.

68. *The Sanitary Elimination of Household Waste.* M-3 Folder. Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. 4 x 9 in.

GARBAGE RECEIVERS.

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

GLASS

American Window Glass Co., Pittsburg, Pa.

69. Send for circular describing different varieties of window glass and how to select the proper kind.

American Three-Way Luxfer Prism Co., Cicero (Chicago), Ill.

70. Write for details and prices of glass prisms that will project daylight into dark interiors.
71. Other literature with reference to apartment house installations.

Plate Glass Mfgs. of America, 1st Nat'l Bank Bldg., Pittsburgh, Pa.

443. *Several folders,* describing the necessity of Plate Glass.

GYPSUM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

HARDWARE

Bridgeport Chain Co., Bridgeport, Conn.

444. *Catalog No.* 14. A 68-page illustrated book, describing an extensive line of chains, stampings and wire.

Caldwell Mfg. Co., 5 Jones Street, Rochester, N. Y.

445. *Sixteen-page illustrated catalog,* entitled "Suggestions for the Present-Day Architect."

Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.

446. *Illustrated catalog and price list* of "Casement Window Specialties."

Griffin Mfg. Co., Erie Pa.

447. *Seventy-six-page illustrated book,* cloth bound, entitled "Hinges."

Hess Warming & Ventilating Co., 1204 Tacoma Bldg., Chicago, Ill.

240. 24-*Page Illustrated Catalog.* 4x6 in. Describing the Sanitary Medicine Cabinet, Lockers and Lavatory Mirrors.

H. B. Ives Co., New Haven, Conn.

448. *Write for their illustrated folder,* describing hardware, window and door specialties.

The Kawneer Co., Niles, Mich.

72. *Kawneer. Simplex Window Fixtures.* Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½ x 10¼ in. 16 pp.

Knapp & Vogt Mfg. Co., Grand Rapids, Mich.

73. Garment Hangers. Send for illustrated booklet.

McKinney Mfg. Co., Pittsburgh, Pa.

449. *McKinney's "Complete Garage Sets,"* an interesting, illustrated eight-page folder.

F. E. Myers & Bro. Co., Ashland, Ohio.

450. *Catalog,* describing the No. 30 Simplex Garage Door Hanger.

National Mfg. Co., Sterling, Ill.

451. *An interesting illustrated catalog* on "Garage Hardware."

Richards-Wilcox Mfg. Co., Aurora, Ill.

75. *Modern Hardware for Your Home.* Catalog of hangers for varnishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Slidetite" garage door hardware. 24 pp. Illustrated. 8½ x 11 in.

Sargent & Company, New Haven, Conn.

45[illegible]. *Sixty-six-page illustrated booklet* on "Planes."

453. *Thirty-six-page illustrated booklet* on "Standard Steel Squares."

The Stanley Works, New Britain, Conn.

76. *Wrought Hardware.* New 1921 Catalog. This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 676 pp. Illustrated. 6½ x 9¼ in.
77. *Garage Hardware.* Booklet, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustration and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.
78. *Eight Garages and Their Stanley Hardware.* Booklet. Plans, drawings and complete hardware specifications. Size 5 x 7 in.
79. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in.

HEATING EQUIPMENT

Bowman Supply & Mfg. Co., 886 Progress, Pittsburgh, Pa.

Co-operative Foundry Co., Rochester, N. Y.

454. *Sixteen-page illustrated booklet,* describing the "Red Cross Empire Pipeless Furnace."

Economy Heater Co., 108 S. La Salle St., Chicago, Ill.

The Farquhar Furnace Company, Wilmington, Ohio.

80. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Illustrated. 4¼ x 5½ in.
81. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Illustrated. 8½ x 11 in.

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

455. *Handy-Man Book,* or Plumbing and Heating Encyclopedia. Price 50c.

Hess Warming & Ventilating Co., 1205D Tacoma Building, Chicago, Ill.

82. *Modern Furnace Heating.* Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.

Kelsey Heating Company, James Street, Syracuse, N. Y.

83. *Booklet No.* 5. 4 x 9. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.
84. *Monroe Pipeless Booklet.* 4½ x 8 in. 20 pp. Illustrated.
85. *Monroe Tubular Heater.* Booklet. 4¼ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
86. *Syracuse Pipeless Booklet.* 4½ x 8 in. 12 pp. Illustrated. General Booklet giving sizes and capacities.
87. *Valves, Syphons and Traps.* A series of pamphlets to enclose in envelopes, describing the well known Thermostatic Return Line Valves and other heating equipment specialties made by this company.

Magee Furnace Co., Boston, Mass.

Strait & Richards, Inc., Newark, N. J.

88. *Catalog* describing fireplaces, electric and gas logs, heaters, etc.

HINGES

McKinney Mfg. Co., Pittsburgh, Pa.

456. *Complete Garage Sets* for all types of hinges. An interesting 8-page folder.

HOISTS—See Elevators

American Saw Mill Machinery Co., Hackettstown, N. J.

89. *Bulletin No.* 10 describing several kinds of builders' hoists.

C., H., and E. Mfg. Co., Milwaukee, Wis.

90. *Bulletin No.* 3. Hoists and Mortar Mixers.

HOLLOW TILE

Fiske & Company, Boston, Mass.

457. *Sixteen-page illustrated booklet,* entitled "Through the Home of Tapestry Brick."
458. *Sixteen-page illustrated booklet,* entitled "Tapestry Brick and Tile Work for Floors and Interior Walls."

Hollow Building Tile Association, Chicago, Ill.

459. *Write* for the "Handbook of Hollow Building Tile Construction. This is an interesting and helpful book.
460. *Seventy-page book,* called "Hollow Building Tile Manual for Builders and Masons." is of vast importance.

National Fire Proofing Co., Pittsburgh, Pa.

461. *Several interesting booklets can be procured,* namely: "Natco on the Farm," "Natco Grain Bins, Corn Cribs and Storage Bins," "Fireproof Buildings of Natco Hollow Tile." Bulletin No. 171, Standard Fire Proofing.

INCINERATORS—See Garbage Destroyers

INSULATION

Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.

92. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.

Samuel Cabot, Inc., 141 Milk St., Boston, Mass.

249. Cabot's Quilt. Catalog containing drawings and description.

U. S. Mineral Wool Co., 280 Madison Avenue, New York, N. Y.

94 *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼ x 6¾ in.

JOISTS AND STUDS, PRESSED STEEL

General Fireproofing Co., Youngstown, Ohio.

462. *An interesting booklet,* called "Industrial Housing," has the actual blue prints in it.

Central Pressed Steel Co., Massillon, Ohio.

96. *Descriptive 4-page folder* on metal lumber for building construction.

Truscon Steel Company, Youngstown, Ohio.

95. *Truscon Steel Joists.* Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

KITCHEN EQUIPMENT

Bisk Corp., Brockton, Mass.



Building Experts Wanted

The Big Money Goes to the Man Who KNOWS

The man who can read plans, make estimates, superintend jobs or take contracts is the man who makes the big money in the building business. Can **you** do these things? If you **can't** do them you are not yet in the real money-making class. You are not prepared for the great rush of building work,—the building boom,—that even now is here.

But, you can become a building expert quickly by giving some of your spare time to home study under the direction of experts of the Chicago Technical College, which for 20 years has been known as "America's Greatest School for Builders." These men will train you in every important branch of the building business by practical and individual instruction on blue print building plans and specifications which we send to you. No "high-brow" book to study. The plans cover all kinds of buildings and are the same as used by the contractor. They are yours to keep.

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There is no longer any need for a man to stay in a job that offers little or no chance for advancement and more money. There is always a market for brains and the man who gets this Chicago Tech. training soon becomes a top-notcher in the building business; he gets more because he is worth more.

There is a building boom coming,—it's here now! Get this training and your opportunity will come quickly. There will be a lot of money made in the next five years by men who know the fine points of the building business. Take the Chicago Tech. Builders' course,—it is planned for practical men. No time given to "fancy" studies or useless theories. Just everyday practical information that you must have to make a big success as a builder.

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You get the same blue prints, the same lessons, etc., that are used by the hundreds of builders who attend our evening school in Chicago. The same experts who teach them are your instructors. You get the same training at home at a big saving of time and money.

Complete Courses for Men in the Building Trades

PLAN READING

How to read a building plan. Floor plans and elevations. Use and meaning of different lines on the plan. Sections and section lines. Cross sections. How different materials are shown on the plan. How to read dimensions. Detail drawings. How to lay out work from the plans. Tracings and blue prints—how they are made. Practice in reading complete plans from basement to roof, etc., etc., etc.

CONSTRUCTION

Brickwork: Footings and foundation walls of brick, concrete and stone. Brick laying, joints in brick work, pointing, tuck pointing, etc. Brick and stone arches. Us. of different kinds of stone.

Carpentry: Kinds and uses of woods, cornices, interior details, framing, roof construction, bridging, miter joints, butt joints, etc. How plans are made. Complete instructions illustrated by working blue prints of residences, apartment buildings, factory buildings, school houses, hospitals, store and office buildings, bank buildings, etc., etc.

ESTIMATING

Practical rules for figuring costs on all classes of construction. Problems worked out from the plans. Methods of practical builders.

Some of the points covered are—Figuring labor and material on brick, frame and concrete work—footings, walls, chimneys, fire places and cisterns. Fire proofing, tile-flooring, arches, partitions, furring, terra cotta, etc.

Lumber and timber figuring board feet. Estimating posts, girders, sills, joists, studs, bridging, rafters, etc. Estimating all kinds of roofs, floors, siding, cornices, etc.

Estimating mill work. Labor and material for window and door frames, sash, blinds, baseboard, wainscoting and all kinds of closets, cupboards, etc. Lathing and plastering, sheet metal work, decorating, glazing, plumbing, heating, wiring, etc.

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Methods of work on all classes of buildings. Uses and preparation of material. Hiring and handling of men.

We also offer complete home-study courses in **Architectural and other branches of Drafting.** If interested in any branch of Drafting mention subject and ask for special catalog.

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(Continued from page 71)

463. *Several interesting booklets*, describing the various types of "Built-In-Kitchens." These are illustrated by actual blue prints.
National Mill & Lumber Co., 2 Rector Street, New York.

277. *10-Page Illustrated Folder.* Describes the necessity and advantages of a National Built-In Ironing Board.

LATH, METAL AND REINFORCING

The Bishopric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.
Bostwick Steel Lath Co., Inc., Niles, Ohio.

279. *"Beautiful Permanent Walls."* 22-page illustrated catalog. 4 x 9 inches.
Central Pressed Steel Co., Massillon, Ohio.
General Fireproofing Co., Youngstown, Ohio.

97. *Catalog* describes Herringbone Rigid Metal Lath, how it is applied and used, with detailed drawings, specifications, etc.
Truscon Steel Co., Youngstown, Ohio.

99. *Hy-Rib and Metal Lath.* 18th Edition. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

LEVELS

A. S. Aloe Co., 513 Olive Street, St. Louis, Mo.
Eugene Dietzgen Co., 162 W. Monroe St., Chicago, Ill.
Keuffel & Esser Co., Hoboken, N. J.
Warren-Knight Company, 136 North 12th St., Philadelphia, Pa.

100. *"Sterling" Levels and Transits.* 32 pp. illustrated catalog. De scription, specifications and structural advantages required in modern practice for establishing lines, levels, angles, etc. Vest Pocket Manual of adjustments.
David White Co., 907 Chestnut Street, Milwaukee, Wis.

464. *Catalog A.* "White's Improved Instruments," is a 36-page booklet with a hard cover and illustrated.

LIGHTING

American Three-Way Prism Co., 1307 South 55 Court, Cicero, Ill.

98. *Descriptive Circular* on the use of prisms for directing light to dark corners.

LIGHTNING RODS

E. G. Washburne Co., 207 Fulton Street, New York.

232. *Descriptive Catalog in Colors.* Showing different designs of weather vanes, lightning rods, ventilators, etc.

LIGHTING SPECIALTIES

I. P. Frink, Inc., 24th Street and 10th Avenue, New York, N. Y.

250. *Lighting Service for Hospitals.* A booklet illustrated with photographs and drawings, showing the types of lights for use in hospitals, as operating table reflectors, linolite and multilite concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses. Size 7 x 10 in. 12 pp.

251. *Frink Reflectors and Lighting Specialties for Stores.* Catalog No. 424. A catalog containing a description of the Frink Lighting System for Stores; the Synthetic System of Window Illumination; and a number of appliances to produce the most effective lighting of displayed objects. 20 pp. Illustrated.

252. *Frink Lighting Service for Banks and Insurance Companies.* Reflectors. Catalog No. 425. A very interesting treatise on the lighting of offices; with details of illustrations and description of lamps and reflectors. Contains a list covering several pages, of banks using Frink Desk and Screen Fixtures. 30 pp. Illustrated. 8¼ x 11 in.

LUMBER

Arkansas Soft Pine Bureau, 802 Boyle Building, Little Rock, Ark.

101. *Arkansas Soft Pine Handbook.* Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Molding Designs.

102. *The Home You Long For.* Booklet. 8¼ x 11 in. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.
Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.

104. *The Post Everlasting.* Booklet. 10¾ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.

228. *Poles That Resist Decay.* Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.

105. *"From Tree to Trade,"* a 48-page illustrated description of the manufacture of lumber from tree to use. Describes methods of logging, construction, etc.
Pacific Lumber Company of Illinois, The, 1105 Lumber Exchange Building, Chicago, Ill.

106. *Engineering Digest.* Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipes, Outbuildings, Irrigation Flumes, Drainage Boxes, Greenhouses, etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.
Southern Cypress Mfrs. Assn., 1227 Poydras Bldg., New Orleans, La.

107. *Many interesting booklets* on the use of Cypress for all purposes.

LUMBER ASBESTOS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

108. *Ambler Asbestos Building Lumber.* Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½ x 11 in.

MARBLE, ARTIFICIAL

Art Stone Co., Waynesboro, Pa.

METAL LATH—See Lath, Metal and Reinforcing

METALS AND METAL BUILDING SPECIALTIES

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.

111. *Reference Book. Pocket Edition.* 2½ x 4½ in. 168 pp. Illus. Covers the complete line of Sheet and Tin Mill Products.

113. *Apollo and Apollo-Keystone Galvanized Sheets.* Catalog. 8½ x 11 in. 20 pp. Illustrated.

114. *Research in the Corrosion Resistance of Copper Steel.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.

115. *Facts Simply and Briefly Told.* Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.

116. *Black Sheets and Special Sheets.* Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc.
Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.
The Donley Bros. Co., 7400 East 74th Street, Cleveland, Ohio.

237. *28-Page Illustrated Catalog* on "Donley Devices and Building Specialties." 6 x 9 in.
N. & G. Taylor Co., Philadelphia, Pa.

117. *Booklet and Detail Sheet of Tin Roofing.* See Roofing.

METAL TRIM—See Doors, Windows and Metal

MILLWORK—See also Lumber—Building Construction—Doors and Windows

MORTAR—See also Cement

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.

118. *Clinton Mortar Colors.* Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

PACKAGE RECEIVER

The Donley Bros., 3700 East 74th Street, Cleveland, Ohio.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Samuel Cabot, Inc., Mfg. Chemists, 141 Milk Street, Boston, Mass.
S. C. Johnson & Son, Racine, Wis.

122. *The Proper Treatment for Floors, Woodwork and Furniture.* Booklet. 6¾ x 8¾ in. 32 pp. Illustrated in color. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.

123. *Portfolio of Wood Panels.* 5½ x 10¾ in. 14 pp. Containing actual panels of finished woods. Also contains valuable information on finishing and re-finishing floors and woodwork.
John Lucas & Co., Inc., Philadelphia, Pa.

264 100-*page "Descriptive Catalog."* 6 x 9 in. Published for the purpose of familiarizing "Lucas" distributors with the characteristics, purposes and uses of "Lucas Paints and Varnishes."
National Lead Co., 111 Broadway, New York City.

124. Handy Book on Painting. Book 5½ x 3¾ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal, etc., both interior and exterior.
Ripolin Co., The, Cleveland, Ohio.

256. *Ripolin Specification Book*, 8 x 10¼ in., 12 pp. Complete architectural specifications and general instructions for the application of Ripolin, the original Holland Enamel Paint. Directions for the proper finishing of wood, metal, plaster, concrete, brick and other surfaces, both interior and exterior, are included in this Specification Book.
Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

131. *Spread the Sunshine Inside.* Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories.

PARTITION SYSTEM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

133. *Loose leaf bulletins*, 8½ x 11 in. Jester-Sackett, consists of plaster board applied to metal channels with special clip, ready for plastering.

PARTITION TILE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

134. *Fireproof.* 32-page booklet, 8½ x 11 in., including description, specifications, and working details of Pyrobar partition tile.

PERGOLAS

Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.

235. *Album No. 33.* 7½ x 10½ in. 42 pages of illustrated literature regarding the various types of Pergolas.

PLASTER BASE

The Bishopric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.

PLASTER BOARD

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

135. *Pamphlets*, describes Sackett Plaster Board used instead of wood or metal lath.

PLASTER, INTERIOR

National Kellastone Co., 155 East Superior Street, Chicago, Ill.

PLUMBING SUPPLIES

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.
Hess Warming & Ventilating Co., 1205D Tacoma Bldg., Chicago, Ill.

136. *Hess Sanitary Steel Medicine Cabinets.* Booklet. 4 x 6 in.
B. Karol & Sons Co., 806 So. Kedzie Avenue, Chicago, Ill.

465. *Write for Catalog K*, describing the complete line of Plumbing and Heating Supplies.

PUMPS

C. H. & E. Mfg. Co., Milwaukee, Wis.

251. Bulletin No. 2. Pumps.
The F. E. Myers & Bro. Co., Ashland, Ohio.

137. *General Catalog.* 6 x 9 in. 392 pages. Shows complete line of Myers Products—Pumps for Every Purpose, Hay Tools, Door Hangers, Store Ladders, etc. Of particular interest to hardware and implement dealers; plumbers, architects, contractors and builders; mill, mine, factory and railway superintendents and purchasing agents; highway contractors and builders.

138. *Catalogs.* 6 x 9 in. Devoted to separate lines: No. 55, Pump—Hand and Power Pumps; No. PP-55, Power Pumps; No. HT-55, Hay Tools, Door Hangers and Store Ladders; No. HP-22, Hydro-Pneumatic Pumps, Electric House Pumps, Direct Water Systems; No. SOP-21, Self-Oiling Power Pumps; No. MC-21, Cylinder and Working Barrels; No. SP-22, Spray Pumps and Spraying Accessories. All catalogs fully illus-

REFRIGERATION

McCray Refrigerator Co., 2264 Lake Street, Kendallville, Ind.

466. *Catalog No. 95*—Refrigerators for Residences.
467. *Catalog No. 53*—Refrigerators for Hotels, Restaurants, Clubs.
468. *Hospitals and Institutions.* Catalog No. 64—Market Coolers and Refrigerator Counters.

ROOF DECKS

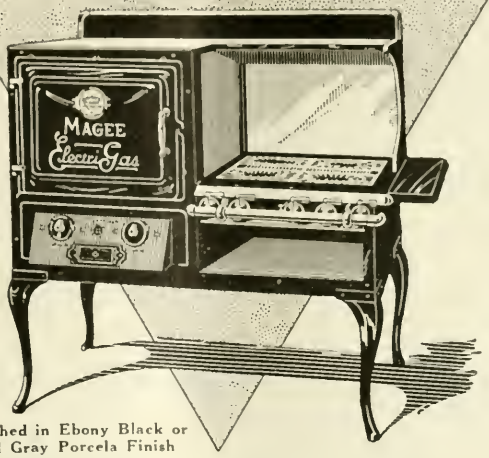
United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

139. *Loose leaf bulletins.* 8½ x 11. Describing Pyrobar Roof Tile, which is laid directly on purlins or tee irons, joints grouted, and is then ready for roof covering.

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IN THE
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MAGEE
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The ELECTRIC half includes:

An Electric Oven or Insulated **Fireless Cooker**, 18 x 18 x 14, an Electric Broiler, and an Outlet Receptacle for Washing Machine, Flat-Iron, etc. These are operated in front from our (Pat.) Switch-board. The Equipment is "Edison," standard throughout the country.



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The GAS half includes:

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A Cabinet Range ½ Electric and ½ Gas a Little Over Four Feet Long That Offers Extraordinary Cooking Capacity—and a Cool Clean Kitchen. An Ideal Combination, Economical and Effective

The Magee ElectriGas Uses the Two Fuels, Electricity, and Gas, in a Manner in Which Each of These Fuels Excel

The Most Remarkable Range Since the Introduction of the Magee Electri-Coal

Write us for full information

MAGEE FURNACE COMPANY

38 Union Street, Boston, Mass.

(Continued from page 76)

ROOFING MATERIALS

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.

American Sheet & Tin Plate Company, Pittsburgh, Pa.

140. *"Better Buildings."* Catalog. 8½ x 11 in. 32 pp. Describing Corrugated and Formed Sheet Steel Roofing and Siding Products—Black, Painted and Galvanized; together with directions for application of various patterns of Sheet Steel Roofing in various types of construction.

112. *Copper—Its Effect Upon Steel for Roofing Tin.* Catalog 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

141. *Specifications and Price List.* Descriptive booklet. Details of Ambler Asbestos Cement Roofing Slates, "Century" Asbestos Shingles and Asbestos Corrugated Sheathings. Tables and drawings. Size 6 x 9 in. 44 pp

142. *Ambler Asbestos Corrugated Roofing.* Catalng gives complete data for specifying, drawings, methods of applications, tables, etc. Size 8½ x 11 in. 20 pp.

Wm. L. Barrell Co. of N. Y., Inc., 50 Leonard Street, New York.

143. *Prepared Canvas for Roofing.* Samples can be obtained on application. A canvas for every use.

Beaver Board Products Co., Inc., Buffalo, N. Y.

469. *Illustrated catalog* will be sent on request.

Blue Ridge Slate Corp., Esmont, Va.

470. *Samples and catalogs* sent on request.

John Boyle & Co., Inc., 112-114 Duane Street, New York, N. Y.

154. *Boyle's Bayonne Roof and Deck Cloth.* List B 93. A prepared roofing canvas guaranteed waterproof for decks and the roofs and floors of piazzas, sun-parlors, sleeping porches, etc.

Copper & Brass Research Association, 25 Broadway, N. Y. City.

267. *"How to Build a Better Home."* 36-page illustrated catalog. 8 x 10½ in. This not only describes but teaches the prospective buyer the essential facts of building, finance, hardware and roofing.

34. *"Copper Roofing,"* a manual for architects and builders. Weights of various roofing materials. Up-to-date practise in the laying of copper roofs—Batten or wood rib method, Standing seam method, Flat copper roofs, Copper shingles, Suggestions for avoiding error and obtaining the full value of copper. Decorative effects and how to obtain them. Flashings, reglets, gutters and leaders. Cornices. Copper-covered walls. Specifications. 32 pp. Ill. 8½x11.

Cortright Metal Roofing Co., Philadelphia, Pa.

236. Four-page circular describing the various shingles.

Creo-Dipt Company, 1025 Oliver Street, North Tonawanda, N. Y.

153. *Standard Stained Shingle.* Samples of different kinds mailed.

154. *Architectural Service Sheets.* 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.

Edwards Mfg. Co., 423 Eggleston Avenue, Cincinnati, Ohio.

471. *Catalog No. 65* describes fully Metal Roofing, Siding, Ornamental Ceilings and other Sheet Metal Work. This is a 210-p. catalog well illustrated.

C. G. Huasey & Co., Pittsburgh, Pa.

227. *Copper Roofing and Flashings.* Book No. 6. 34 pp.

Illinois Zinc Company, 280 Broadway, New York, N. Y.

155. *Pure Rolled Zinc.* (Corrugated and Plain Sheets.) Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Facts regarding adaptability of zinc for roofing. Specifications of corrugated zinc sheets. Weights per square. Comparative gauge lists.

156. *The Roof That's Always New.* Booklet. 3¾ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley, ridge and hip piece.

National Sheet Metal Roofing Co., 339 Grand St., Jersey City, N. J.

159. *Manufacturers of Metal Shingles* in various designs, both in painted tin or galvanized iron. Samples sent on request.

Richardson Co., Lockland, Cincinnati, Ohio

472. *Four-page folder*, describing the Flex-A-Tile Roll Shingle Roofing.

F. C. Sheldon Slate Co., Granville, N. Y.

473. *Sixteen-page colored catalog*, describing the "Most Attractive Roof at the Most Reasonable Cost."

N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.

160. *Selling Arguments for Tin Roofing.* Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

161. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins. 8½ x 11. Pyrofill.

Vendor Slate Co., Easton, Pa.

474. *"A Book for Architects"* is the title of the new 24-page, well-illustrated catalog.

Vulcanite Roofing Co., Buffalo, N. Y.

475. *Interesting booklets*, describing the "Better Shingle" and "Vulcanite Roll Roofings."

RULES

A. S. Aloe, St. Louis, Mo.

Eugene Dietzgen Co., 162 Ft. Monroe Street, Chicago, Ill.

476. *Write for an instructive circular.*

Keuffel & Esser, Hoboken, N. J.

Sargent & Co., New Haven, Conn.

Stanley Rule & Level Co., New Britain, Conn.

SASH CHAINS, HOOKS AND ATTACHMENTS

The Bridgeport Chain Co., Bridgeport, Conn.

209. *An interesting catalog* describing fully Sash Chain in Steel (six sizes and six finishes), in Bronze (six sizes), Hooks and Sash Chain Attachments.

SASH CORD

Samson Cordage Works, Boston, Mass.

477. *An interesting catalog* with actual samples of the various grades of cordage therein.

SAW MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.

162. *Catalog No. 21*, describing Circular Saws of all sizes.

163. *General Catalog No. 22* and *special Bulletin No. 77*, describing sawing machinery for use on the job in the shop.

W. F. & John Barnes Co., 71 Ruddy Street, Rockford, Ill.

478. *Catalog No. 84* describes in full detail the Patent Foot and Hand Power Wood Working Machinery.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.

164. *Bulletin No. 1, Saw Rigs.*

Crescent Machine Co., 206 Main Street, Leetonia, Ohio.

479. *This 1921 catalog* contains improvements on No. 3 and No. 4 Saw Tables, No. 2 Motor-Driven Saw Table, New Motor-Driven Sharper, Hollow Chisel Mortiser.

Huther Bros. Saw Mfg. Co., Rochester, N. Y.

480. *Catalog No. 38* describes the complete line of Saws.

C. E. Jennings Co., 321 Winthrop Avenue, New Haven, Conn.

481. *An interesting* 46-page Tool Chest Catalog may be had on request.

Parke Ball Bearing Machine Co., Station A. Cincinnati, Ohio.

482. *Catalog B* describes in detail Wood Working Machines.

Sidney Machine Tool Co., Sidney, Ohio.

483. *Twelve-page illustrated booklet*, describing the "Famous Universal Wood Workers."

484. *One hundred-page, pocket-size catalog*, giving full information on the "Famous Woodworking Machinery."

SAWS

E. C. Atkins Co., Indianapolis, Ind.

286. Booklet and chart describing saws. Especially the cross cut saw.

SCREENS

American Wire Fabrics Company, 208 So. La Salle St., Chic., Ill.

165. *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enamel, galvanized, galvanoid, American bronze. 30 pp. Illustrated. 3½ x 6¼ in.

SHEATHING

Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.

171. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.

U. S. Gypsum Company, 205 West Monroe St., Chicago, Ill.

173. *Eight-page Folder.* Describes Adamant Sheathing Board for use instead of wood sheathing.

SHINGLES—ASPHALT

Winthrop Tapered Asphalt Shingles, 19 So. La Salle St., Dept. No. D-20, Chicago, Ill.

SHINGLES—METAL

Cortright Metal Roofing Co., 50 North 23rd St., Philadelphia, Pa.

174. *"Concerning That Roof."* A complete catalog describing and illustrating Cortright Metal Shingles and Trimmings. 7 x 10¾ in. 32 pp.

SHOWERS, CURTAINLESS

Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.

260. *4-page File and Reference Sheet* describing six different models of the shower.

SLATE—See also Roofing

Blue Ridge Slate Corp., Esmont, Va.

Knickerbocker Slate Corp., 153 East 38th Street, New York, N. Y.

485. *Four-page folder*, describing the "Graduated Slate Roofs."

F. C. Sheldon Slate Co., Granville, N. Y.

175. *Commercial and Architectural Roofing Slate* in all colors and textures. Also blackboards, structural and electrical slate. Slate Granules.

Vendor Slate Co., Easton, Pa.

STAIRWAYS

Bessler Movable Stairway Co., Akron, Ohio.

169. *Illustrated catalog*, containing 24 pp., describes how the Bessler Movable Stairway saves floor space and adds an extra convenience to the home.

STANDARD BUILDINGS

Truscon Steel Co., Youngstown, Ohio.

176. *Truscon Standard Buildings.* Fourth Edition. Catalog. 8½ x 11 in. 40 pp. Illustrated. Erection details, cross-section diagrams and adaptations are given.

STONE, BUILDING

Art Stone Co., Waynesboro, Pa.

170. *Descriptive circulars with illustrations* of different marbles in colors. Sent free to any interested party.

STORE FRONTS

J. W. Coulson Co., Columbus, Ohio.

278. Store Front Construction simplifies the problem for the builder and owner. It beautifies and enhances the value of store property. A special device prevents glass breaking.

Detroit Show Case Co., 1660 W. Fort Street, Detroit, Mich.

486. *Write for* "Full Size Details of Desco Metal Store Front Construction." This illustrates by means of blue prints the various store fronts.

Kawneer Co., Niles, Mich.

177. *Kawneer Store Front.* Illustrated catalog. Drawings and details of construction. Size 8½ x 11 in. 32 pp.

178. *Full Size Details Kawneer Construction.* Blue prints. Size 30 x 30 in.

179. *A Collection of Successful Designs.* Portfolio. Shows 24 typical store fronts with elevations. Size 9 x 12 in. 32 pp. Catalog B. J. 8. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STRUCTURAL STEEL

Central Pressed Steel Co., Massillon, Ohio.

STUCCO—See also Cement

American Materials Co., 101 Park Avenue, New York, N. Y.

487. *A 32-page illustrated catalog*, describing "Elastica," the Stucco of Permanent Beauty.

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

182. *The Stucco House.* Contains many beautiful illustrations of houses finished with stucco and selected particularly for their architectural value. Detailed illustrations of stucco surface textures and drawings showing wall construction with revised specifications covering application of stucco. 96 pp. 8½ x 11 in. Price 50 cents.



Roof stained with Cabot's Creosote Stains. Walls finished with Old Virginia White. Lined with Cabot's Quilt for warmth.
Prentice Sawyer, Architect, New York

For Roofs, Siding, Timbers and all Other Outside Woodwork

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They have *proved* their merit in every climate for nearly forty years. The colors are soft, rich and harmonious, the Creosote penetrates the wood, preserves it, and makes it less inflammable. Shingles make the warmest and cheapest outside finish and a shingled house stained with Cabot's Stains is the ideal, cozy American country home.

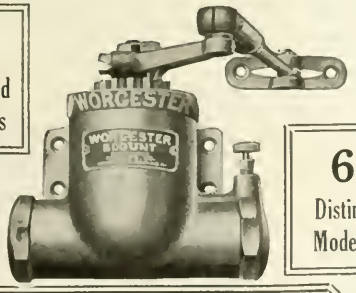
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A scientific heat insulator and sound-deadener that makes houses warmer in winter and cooler in summer and deadens sounds in floors and partitions. Not a mere felt or paper, but a non-conducting mat that is about thirty times warmer than common papers.

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6 Distinct Models

Every Good Feature A Door Check Should Have

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Works smoothly — silently — efficiently. Eliminates noise, draughts and breakage from slamming doors. Actually lengthens the life of doors!

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THE BOSTWICK STEEL
LATH COMPANY
Niles, Ohio

Bostwick "TRUSS LOOP"



(Continued from page 78)

180. *Guide to Good Stucco.* A book telling of the advantages of Portland Cement stucco, and how to apply it. Shows numerous finishes obtainable with ATLAS WHITE Portland Cement. 28 pages. 8½ x 11 in.

The Bishopric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.

National Kellastone Company, 155 E. Superior St., Chicago, Ill.

183. *Specifications for Stucco Work.* A booklet containing complete specifications in detail for the use of Kellastone stucco for new buildings as well as the "overcoating" of old buildings. 13 sheets of text, 2 sheets of illustrations. 8 x 11 in.

184. *The Story of Kellastone Imperishable Stucco.* In this most interesting book the merits of Kellastone are set forth in a convincing manner. Every page contains pictures of beautiful houses stuccoed with Kellastone, and there are two pages in color. 22 pp. Illustrated. 8½ x 12 in.

Rocbond Co., Van Wert, Ohio.

168. *"Fortifies Your Home Against the Elements and Time."* 16-page folder. 3½ x 6 in.

269. *"Better Homes."* 12-page booklet, 7¾ x 8 in., describing the advantages of "Rocbond."

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Avenue, Cincinnati, Ohio.

181. *Bishopric for All Time and Clime.* Catalog. 7½ x 11 in. 52 pp. Illustrated. Describing the use of Bishopric Stucco and Plaster Base and Bishopric Sheathing.

STUCCO-MAGNESITE—See Stucco

American Materials Company, 101 Park Avenue, New York, N. Y.; Weed Street and Sheffield Avenue, Chicago, Ill.

185. *Elastico, the Stucco of Permanent Beauty.* Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.

Natl. Kellastone Co., 155 East Superior St., Chicago, Ill.

188. *An interesting handbook,* telling the story of "Kelllastone."

189. *Catalog No. 100,* giving the specifications for Stucco Work.

United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

SURVEYORS' INSTRUMENTS—See Levels

SUSPENDED CEILING

U. S. Gypsum Company, 205 West Monroe Street, Chicago, Ill.

186. *Loose-leaf Bulletins.* 8½ x 11. Jester-Sasket, consists of plaster board applied to metal channels with special clip, ready for plastering.

THERMOSTATS—See Heating Equipment

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Building, Chicago, Ill.

187. *Handbook of Hollow Building Tile Construction.* 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.

National Fire Proofing Co., 250 Federal Street, Pittsburgh, Pa.

188. *Standard Wall Construction Bulletin* 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.

189. *Industrial Housing Bulletin* 172. 8½ x 11 in. Illustrated. Photographs and floor plans of typical workingmen's homes.

190. *Natco on the Farm.* 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.

TIMBER CLAMP

Schenk Timber Clamp Co., 501 Fifth Avenue, New York City.

490. *Several interesting descriptive folders* may be had on request.

TOILET PARTITIONS—STEEL

Hart & Hutchinson, New Britain, Conn.

284. Write for this Catalog, describing the sanitary and durable usages of these partitions.

TOOLS

C. E. Jennings & Co., 321 Winthrop Avenue, New Haven, Conn.

Mack Tool Co., Rochester, N. Y.

491. *An interesting Carpenter's Catalog* may be had on request.

492. *"Love Stories,"* a lively booklet, bound to be pleasant and worth while reading.

Progressive Mfg. Co., Torrington, Conn.

493. *Twelve-page booklet,* describing the "Forstner Bits."

Sargent & Co., New Haven, Conn.

Stanley Works, New Britain, Conn.

494. *A 64-page catalog,* describing "Bronze and Steel Butts," by detailed drawings.

495. *An essential catalog* of 380 pages, giving the entire line of Wrought Hardware.

James Swan & Co., Seymour, Conn.

496. *An interesting 104-page catalog,* describing "Premium Mechanics' Tools."

The L. & I. J. White Co., Buffalo, N. Y.

497. *Catalog No. 19A* describes Carpenters' Tools.

498. *Catalog No. 20B* describes Coopers' Tools.

TRACTORS

C. H. & E. Mfg. Co., Milwaukee, Wis.

275. Bulletin No. 4, Tractors.

TRAILERS

Rogers Bros. Co., Albion, Pa.

499. *A 26-page cloth bound catalog,* describing the "All Steel Trailers."

TRANSITS (See Levels)

Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.

TRUSS LOOPS

The Bostwick Steel Lath Co., Niles, Ohio.

279 *"Beautiful Permanent Walls,"* 22-page illustrated catalog.

VENTILATION

Danzer Metal Products, Hagerstown, Md.

Royal Ventilator Company, 415 Locust Street, Philadelphia, Pa.

193. *Descriptive Catalog* of round and rectangular ventilators made in galvanized iron, copper, etc. Illustrated.

E. G. Washburne Co., 207 Fulton Street, New York, N. Y.

194. *Illustrated Booklet* of metal ventilators, weather vanes, lightning rods, etc.

WALL BOARDS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

195. *Descriptive catalog and sample of Linabestos Wall Board* for interior construction. Flame-proof and fire-resisting wall board.

196. *Illustrated folder,* describing various uses and the methods of handling Beaver Board to the best advantage. Samples with descriptive literature sent on application.

Compo-Board Co., 5778 Lyndale Avenue, North, Minneapolis, Minn.

199. *Catalog sent on request with sample.* Describes many uses of Compo-Board.

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

201. *Walls of Worth.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Describes Sheetrock, the fireproof wall board, its advantages and uses.

Upson Company, Lockport, N. Y.

WALL FURRING

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.

202. *Thirty-two-page Booklet.* 8½ x 11 in. Pyrobar. Tile.

WATER HEATER

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WATERPROOFING—See also Dampproofing

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

206. *Science and Practice of Integral Waterproofing.* Pocket size. 33 pp. Illustrated. Contains full specifications for waterproofing MASS Concrete, stucco and Cement Plaster Coat. Entire chapter devoted to "Practical Application of Waterproofed Cement Plaster Coat."

207. *Technical Pamphlet No. 8.* Booklet. 4 x 7 in. 28 pp. A discussion of why concrete requires waterproofing and the properties an integral waterproofing must possess to operate effectively with the natural properties of concrete.

WATER SUPPLY SYSTEM

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WEATHER STRIPS

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.

239. Six-page illustrated circular, describing the product as used for Hotels, Residences and Institutions.

Diamond Metal Weatherstrip Co., Columbus, Ohio.

242. 34-page illustrated catalog. 8½ x 11¼ in. Containing blue prints of the various styles and sizes of Weatherstrip.

Monarch Metal Products Co., 5020-26 Penrose Street, St. Louis.

210. *Cause and Effect.* A series of pamphlets describing Monarch Metal Weather Strips, which are made of bronze, brass and zinc. They differ from all other strips in that they are applied in spaces around doors and windows as elastic fillers and not over the space as covers. Each 4 pp.

WEATHER VANES

Danzer Metal Products, Hagerstown, Md.

E. G. Washburne & Co., 207 Fulton Street, New York, N. Y.

211. *Descriptive Catalog in Colors.* Showing two different designs of weather vanes, lightning rods, ventilators, etc.

WINDOWS—See Also Doors and Windows

The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.

280. BOCA steel sash. (E-22). A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages.

Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.

Hope & Sons, Henry, 103 Park Avenue, New York.

212. *Catalog.* 12¼ x 8½ in. 30 pp. Illustrated. Full size details of outward and inward opening casements.

WINDOW CASEMENTS

The Bogert & Carlough Company, 30 Peach Street, Paterson, N. J.

WINDOW HARDWARE

The Bridgeport Chain Co., Bridgeport, Conn.

266. *Interesting catalog* describing Sash Chains, Hooks and Sash Chain Attachments.

Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.

The Kawneer Company, Niles, Mich.

213. *Kawneer Semplex Windows.* Catalog. 8½ x 10½ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installations in residences and buildings of all sorts.

214. *Detail Sheets and Installation Instructions.* Valuable for architects and builders.

Monarch Metal Products Co., 5020 Penrose Street, St. Louis, Mo.

282. 16-page illustrated catalog, 4 x 9 in., on Window Casements.

National Mfg. Co., Sterling, Ill.

500. *An interesting, well illustrated catalog.*

Pullman Mfg. Co., Rochester, N. Y.

502. *Catalog No. 37,* describing the "Unit Sash Balances."

Samson Cordage Works, Boston, Mass.

501. *Catalog.* 3½ x 6¼ in. 24 pp. Illus. Covers complete line.

Sargent & Co., New Haven, Conn.

Stanley Works, New Britain, Conn.

WOODWORKING MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.

217. *Contractors' Bulletin No. 77.* Describing various types of portable Variety Woodworkers. General catalog No. 22, describing a general line of woodworking machinery.

W. F. & John Barnes Co., 71 Rudy Street, Rockford, Ill.

218. *Catalog.* Containing description of rip and other machine saws, formers, mortises, tenoners, lathes. 38 pp. Illustrated.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.

219 *Catalog* of portable saw rigs, pumps, compressors, engines, etc.

The Crescent Machine Co., 259 Main Street, Leetonia, Ohio.

220. *Catalog.* Describing band saws, shapers, jointers, planers, borers, mortises, etc. 144 pp. Pocket size. Illustrated.

R. E. Kidder Co., 35 Hermon Street, Worcester, Mass.

222. Catalog. Describing improved boring machine and how it can be used.

Parks' Ball Bearing Machine Co., Sta. "A," Cincinnati, Ohio.

223. *Illustrated Folder.* Describing Parks' Planing Mill Special, comprising circular saw, jointer, band saw, shaper, borer, tenoner, etc.

J. D. Wallace & Co., 1401 Jackson Boulevard, Chicago, Ill.

225. *Bulletin No. 219-K.* Describes portable electric punch machines, tools, planers, jointers, circular saw, etc.

Woodworkers Mfg. Co., 614 Bush Street, Detroit, Mich.

American Universal Floor Surfacing
THE BIG PROFIT SYSTEM

The American Universal Floor Surfacing Machine is the best money maker the contractor can own. It is practically "fool proof" and can be operated by any man of ordinary ability and do only the best grade of work, for its operation is automatic. When your building is about ready to turn over to the owner, it does the last big job, the floors, when everyone is anxious, quickly and perfectly, leaving everyone feeling satisfied. One man and one American Universal does the work of six men and does it perfectly.

Old Floors Made Like New—New Floors Made Perfect

Contractors owning American Floor Surfacing Machines keep them going all the time at big profits on old floors when they are not needed on the new work—this is an excellent source of profits. Often, too, floor surfacing contracts are taken on other jobs. Just read what users say about the labor-saving, money-making ability of the American Universal. Hundreds of others have gone into the floor surfacing business and are independently well fixed.



Saves Labor of Six Men and Does Better Work
We can surface more floors with our "American Universal" machine than six men can scrape by hand, considering the quality of the work.—Schneider & Hein, Nebr.

Would Not Go Back to Old Way
The "American Universal" is a great labor saver, doing the work of about eight men so naturally I would never consider going back to hand scraping again.—M. R. Warner, Colo.

Surfaces 1500 Square Feet Per Day
The "American Universal" does all you claim, for it has surfaced 1500 square feet of flooring per day for me and is doing the work of six men.—L. F. Walla, Va.

Customers Satisfied—Business Increases
The "American Universal" has replaced five men at least on my payroll, does better work than before, and so, as my customers are so well pleased, I have found my business increasing right along.—A. O. Thompson, Ark.

Replaces 10 Men
The "American Universal" replaces ten men on my pay roll, and surely does excellent work.—I. O. Fetterolf.

Machine Does Better Work Than Hand Scraping
The "American Universal" has replaced five men on my pay roll, and I can do a better quality of work with my machine than by hand scraping.—L. L. Howard, Kans.

Quality of Work Only Advertisement Necessary to Secure More Work
I want to tell you that the "American Universal" is some labor saver—it replaces at least five men on my pay roll, and the quality of work it turns out is all the advertisement I need for my business.—Hugh A. Cox, Fla.

Afraid to Go Back to Hand Work
Since the "American Universal" has proven such a great labor saver, would not dare to go back to the old method of hand scraping.—C. E. Andrews, Pa.

Saves Six Men
The "American Universal" replaces six men on my pay roll and I find it to be a great labor saver.—E. A. Bittner, Pa.

Light and Easy to Handle
In the first place the "American Universal" machine is light and easy to handle and does lots more work than the other sander of a different make which I have.—Krofftanz and Frank, Mont.

No Kicks—Replaces Six Men
Want to tell you that I've never had a kick about unsatisfactory work from any of my customers ever since I bought the "American Universal" and it replaces six men on my pay roll, too.—A. F. Grow Brothers, Nebr.

Saves Ten Men
Your "American Universal" floor surfacing machine is a labor saver. It will do the work of ten men in one and in much better shape.—M. R. Hattier, S. D.

The American Floor Surfacing Machine Company

521 So. St. Clair Street — *Originators of Floor Surfacing Machines* — **Toledo, Ohio**

THE AMERICAN FLOOR SURFACING MACHINE CO.,
521 So. St. Clair St., Toledo, Ohio.

Gentlemen: Please send me without obligation to me complete information and literature on your proposition. The following information will no doubt assist you in advising me:

( ) I want to become a Floor Surfacing Contractor.
( ) I am not now a contractor of any kind but was in the following business .....
( ) I am a Building Contractor and want to use it on my own contracts.

Name ..... Street ..... City ..... State .....

KOEHRING

DANDIE

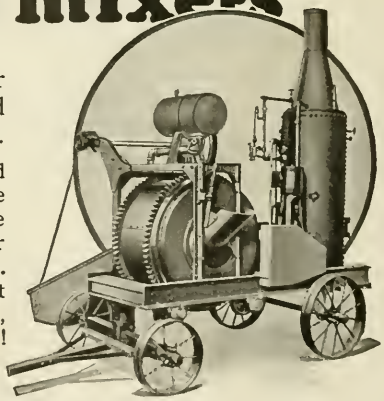
Light Mixer



–yet it is within the price range for light mixers

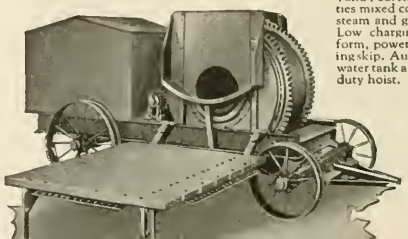
THE Dandie is a light, easily portable mixer for concrete footings, culverts, floors, and has also proved suitable for mortar mixing.

It is a Koehring mixer—Koehring designed and constructed—and this means that dependability and long service life are the first considerations, not lowest price. No it is not the lowest priced mixer, but is well within the price range for light mixers, making it the greatest ***value*** in light mixer field. It sets a new standard of efficiency and value for light mixers. Big production, standardization in every part, and automatic shop equipment keeps the price down!



Send Today for Catalog D 4

Get the details of construction—the liberal drum dimensions—double gear drum drive—the drum roller construction—universal bearings, mixing action—the two side discharge control—trouble-proof power—dust-proof housing. Get these details and you will see why the Dandie offers a remarkable value. Write for catalog D 4 today.



4 and 7 cu. ft. capacities mixed concrete, steam and gasoline. Low charging platform, power charging skip. Automatic water tank and light duty hoist.

KOEHRING COMPANY
MILWAUKEE WISCONSIN

BUILDING AGE
AND
THE BUILDERS' JOURNAL

NEW YORK, NOVEMBER, 1922

The Washington Memorial at Valley Forge

WINTER work is the theme of this issue of BUILDING AGE AND THE BUILDERS' JOURNAL. We who are enjoying the prosperity of a wonderful country should pause and consider that all this would not be possible had it not been for the work done that one winter at Valley Forge by Washington and his army of patriots.

Were it not for the stout hearts and courage of the Continental Army to do Winter Work, very few of us, perhaps, would today be enjoying the comforts of a home in the United States. It is only fitting that we should perpetuate the record of their sacrifices in a suitable memorial at Valley Forge, Pa. The words of Mr. Brady given here sum up the greatness of this beloved and historic spot, dear to thousands of patriotic Americans, and conceded to be the one shrine of American Patriotism to which every citizen should journey at one time or another and give it due reverence. The building work now being done there is of national importance and rightly deserves every possible bit of publicity given it.

NO spot on Earth, not the plains of Marathon, nor the passes of Sempach, nor the place of the Bastile, nor the dykes of Holland, nor the moors of England, is so sacred in the history of the struggle for human liberty as Valley Forge.

—Cyrus Townsend Brady

The Washington Memorial, when completed, will be one of the greatest memorials in the world. It contains



The Old Home of Dutch Colonial Design at Valley Forge, Pa., Used as Headquarters by George Washington



The Washington Memorial Chapel at Valley Forge. A Stone Edifice of Dignified Gothic Architecture.

much of an educational value, holding in its mass many different kinds of workmansihp that have been wrought through careful study and the benefit of education of a vast nature. Its conception has won the admiration of patriots, and its completion will give to the American people a group of buildings of rare beauty and unequaled significance.

The Washington Memorial stands upon a commanding site at Valley Forge, in full view of almost the entire encampment and facing the great National Arch, erected by the United States in memory of the officers and men who made these hills sacred ground.

The memorial will include the following structures: The Patriots Hall, Washington Memorial Chapel, Washington Memorial Library, Cloister of the Colonies, Porch of the Allies, Thanksgiving Tower, and the Woodlawn Cathedral. These will form the administration group of the memorial.

In addition there will also be eight Halls of History, wherein the entire nation's history will be in review, affording a truly great and wonderful education for anyone. The different halls are named: (1) The Aborigines, Pocahontas Hall. (2) The European Background, Raleigh Hall. (3) The Colonial Period, Franklin Hall. (4) The War of the Revolution, Washington Hall. (5) The Period of National Development, Jefferson Hall. (6) The Civil War, Lincoln Hall. (7) The Period of National Expansion. (8) The World War, Victory Hall.

The Halls of History of the Valley Forge Museum of American History will culminate in Victory Hall. This will represent not only the last period to date, but will be the greatest of the eight buildings. It will represent man's last and supreme battle for freedom, for the larger life of man. It will be a great national memorial to the men and women whose devotion and sacrifice won the victory. It will honor all the allies, but it will be pre-eminent as America's tribute to her heroic sons and daughters.

All that art and building craft can do will be employed to give expression to the meaning of the conflict between brute force and the spiritual life of man. It will be carved in the stone tracery, leaded in the windows and painted on the walls.



Charming Exterior Corner of Chapel with the Statue of "Peace and Devotion"

Such a conception realized anywhere in the land would become at once the mecca of today, tomorrow and for all time. Such a Victory Hall will have a hundred fold more value when built upon the hills of Valley Forge, where it stands surrounded by the unmarked graves of those who nearly a century and a half ago heard the call of duty, rose to fight for freedom, and gave their all for the American ideal of democracy.

The Rev. W. Herbert Burke, D.D., who is president of the Valley Forge Historical Society, has been and is an untiring worker in this great memorial idea. Recognizing the historical importance of Valley Forge and appreciating the importance of its ideals and spirit in the life of the nation, Dr. Burke suggested in 1903 the erection of the Washington Memorial at Valley Forge as a national shrine and as a school of patriotism.



A Replica of One of the Hospitals. Their Best Was Far From Comfortable.



Interior of the Washington Memorial Chapel

The Washington Memorial Chapel, an American Westminster, the shrine of the American people, has been completed, and in the past two years attracted over 90,000 visitors. Its beauty and historic significance are unexcelled.

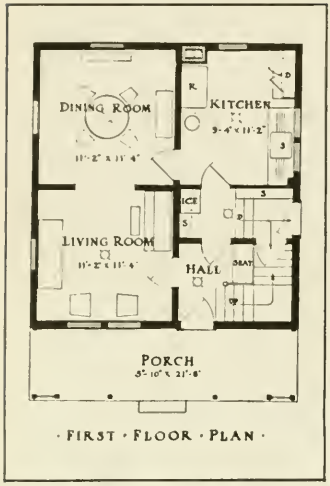
Into its sacred fabric and furnishings has been woven the history of the nation, and its many memorials commemorate not only Washington, but all who labored with him in the building of the nation. In it are memorials of the men and women who made our great Republic.

The screens in memory of Washington and the Major and Brigadier Generals at Valley Forge, and the choir stalls in memory of the brigades, make a collection of memorials unequaled in importance and patriotic inspiration anywhere.

The extent and scope of a great work should interest every loyal American. All who make the trip to Valley Forge will be well repaid and will go away with a deeper and finer sense of patriotism than ever before. Valley Forge is today THE really great and true shrine of American patriotism. Valley Forge, being near Philadelphia, is easily reached from many points. All should see it.

C. H. Thomas.

Variety in House Design

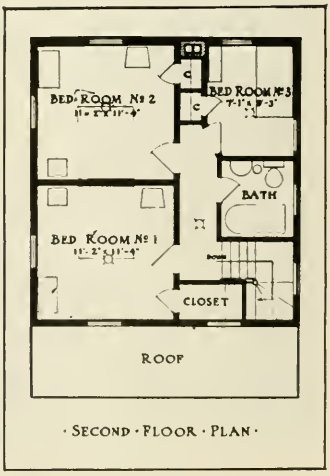


· FIRST · FLOOR · PLAN ·





Designed by
MURPHY & DANA
Architects
for a development at
New Britain, Conn.



· SECOND · FLOOR · PLAN ·

Slight Changes in Details Prevent Sameness

Designed by C. E. SCHERMERHORN, Architect

IN building a number of small houses it is more economical that they be made all alike in interior arrangements and exterior design. Perhaps only a few exterior details are changed to lend a little variety, sometimes the only change is the difference in painting.

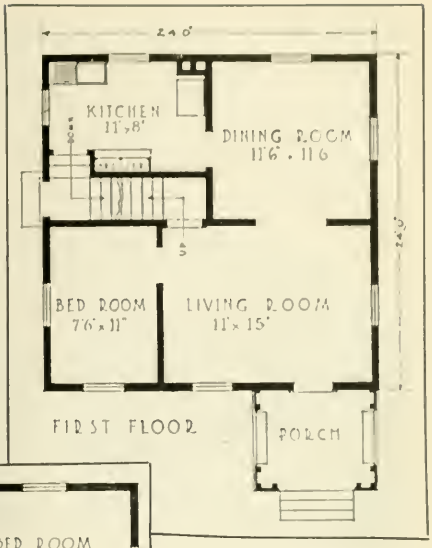
To show that a considerable change in appearance may be made and still have the same design, we give a picture of two houses that are identically the same in room arrangement and exterior. The houses are 24 feet by 24 feet in size. On the one, the gable is towards the front, and on the other it is towards the side. Likewise, the one has the front entrance on the side and the other in the front. This simple change results in both houses having a distinctiveness of its own.

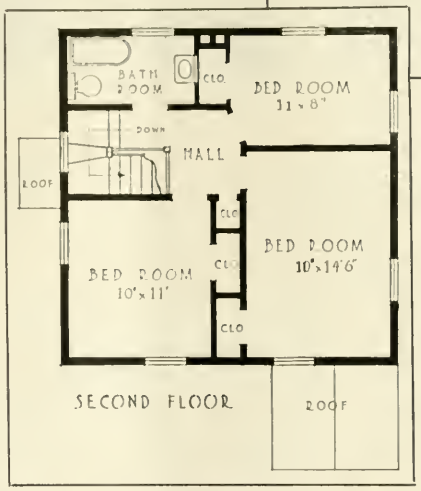
A further change could be made if there are a number of such houses in a row is to have some set back further than others, that is, to give some thought to a proper grouping. Another variation would be to have the porch in the center on some houses.

The room arrangement in this small house is worthy of special study. There are seven fair sized rooms in the small space of 24 feet by 24 feet. Each room has been so planned that there is ample space for all necessary furniture. There is no waste space, each bedroom is provided with a closet and there is a linen closet in the upper hall.

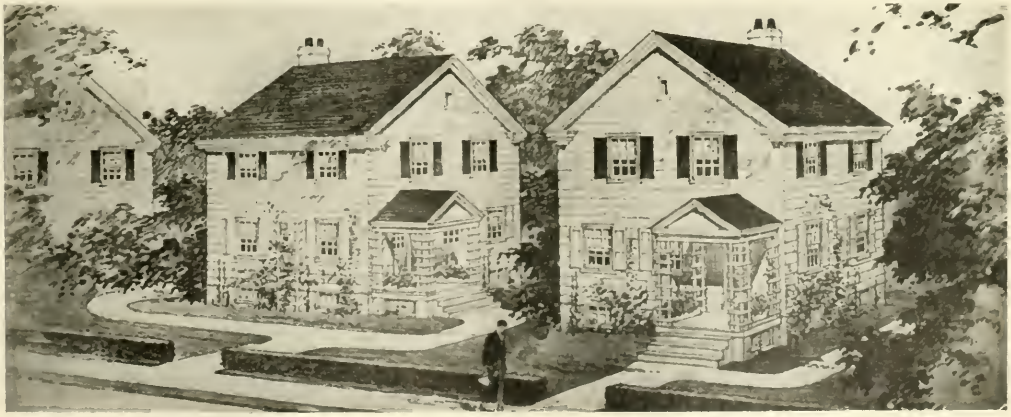
For anyone requiring a small home that can be built at a moderate price and still have a pleasing design, a house of this kind is to be recommended.

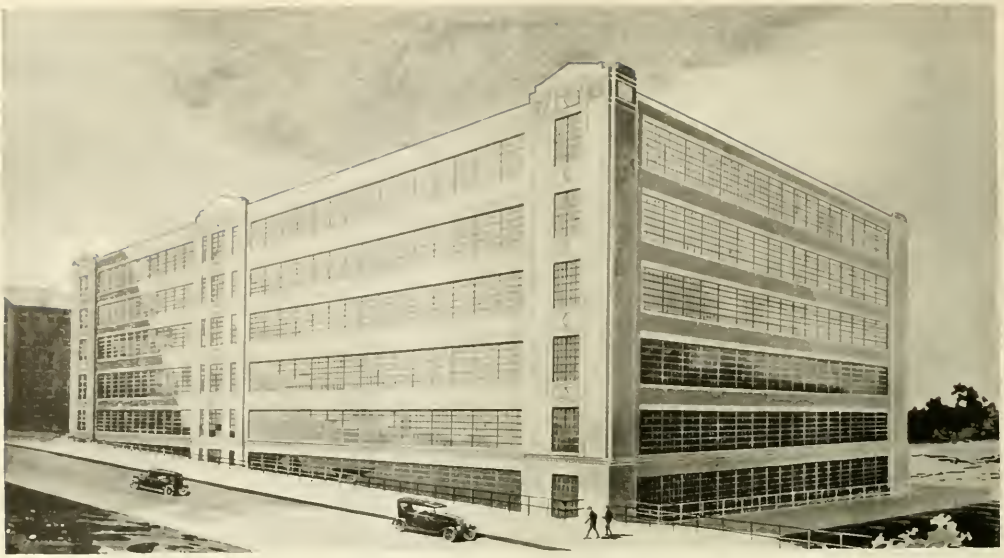
The exterior of these houses can either be shingled or have wide Colonial clapboards with mitered corners. To lend variety in a group some houses could have a stucco exterior and some others be built of brick or in combination.





The design shown on the opposite page is another interesting example of how small changes may be made to secure a variety in design. Here also the one house has the gable to the front while on the other it is to the side, with the porch extending half way across the front and floor plans reversed.





New Departure in Building Construction
The Glass Front Factory

By WILLIAM R. FOGG

ONE of the prime requisites for the production of first quality work under economical conditions is that the rooms in which work is performed shall be provided with ample daylight. The older forms of factory construction consisted of more blank wall space than windows, while the modern tendency has been to make the windows as large as possible.

The majority of recently built factories consists of a series of large steel sash windows with columns between, which for architectural effect have been treated as pilasters, and many an artistic factory building has been the result. In these the pilasters and intermedite rails below the windows are frequently of ornamental brick work, concrete with tile inserts, terra cotta, etc.

The latest step in securing the maximum amount of daylight in the interior of a factory itself is by practically eliminating the pilasters and having what amounts to all glass walls. This result is insured by the new features in industrial building construction which have been envolved by the Ballinger Company, architects and engineers of Philadelphia, and embodied in the construction of a new worsted mill now being erected at Bridgeport, Pa., for James Lees and Sons Company.

This new building is an addition to the present plant operated by this company, and it will be five stories and basement in height. The total length from the front and rear is 250 feet with a depth of 121 feet; this is exclusive of the stair towers. These six floors will give a total area of about 180,000 square feet and will be used for the housing of machinery, etc., used in the manufacture of worsted yarns.

This interesting industrial building is of reinforced concrete, flat slab construction. On account of the delicate nature of the machinery employed in the manufacture of the worsted yarn, danger from dust had to be guarded against, and for this reason a maple floor was used as a top wearing surface.

The unique feature in the construction of this factory consists of the entire omission of exterior wall columns permitting if desired an unbroken line of light around the entire building, except at spaces where the wall surface is necessarily broken by stairways or other features.

This arrangement results in permitting an unusual amount of light to flood the interior of the building, adapting it admirably to the purposes of manufacturing. In this particular case a building 120 feet wide has been erected without requiring an excessive story height to obtain the proper daylight illumination that has been found so necessary to a proper working by the operators at the looms.

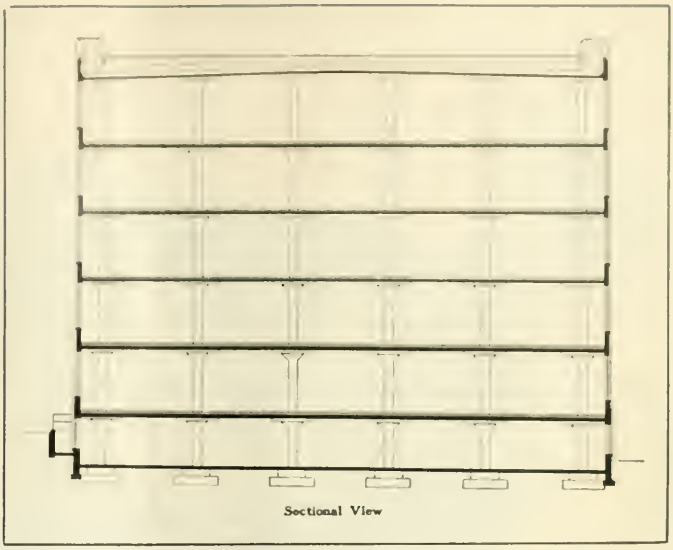
This unbroken extent of window space has been made possible by making use of the well-known principle of the cantilever. The first row of interior columns is placed five feet back from the outer

wall and the concrete floor slabs extend as a cantilever beyond the columns to the wall line. The structural walls under the windows are built directly upon the projecting cantilever floor slabs, they have to bear the weight of the steel windows and in addition a certain floor load.

This ingenious method of construction gives not only a maximum amount of daylight but by the elimination of wall columns or pilasters, the concrete work itself is simplified so that economy in the construction work is obtained by making use of this cantilever principle. A rather considerable saving in the cost of erecting such a building results by this method.

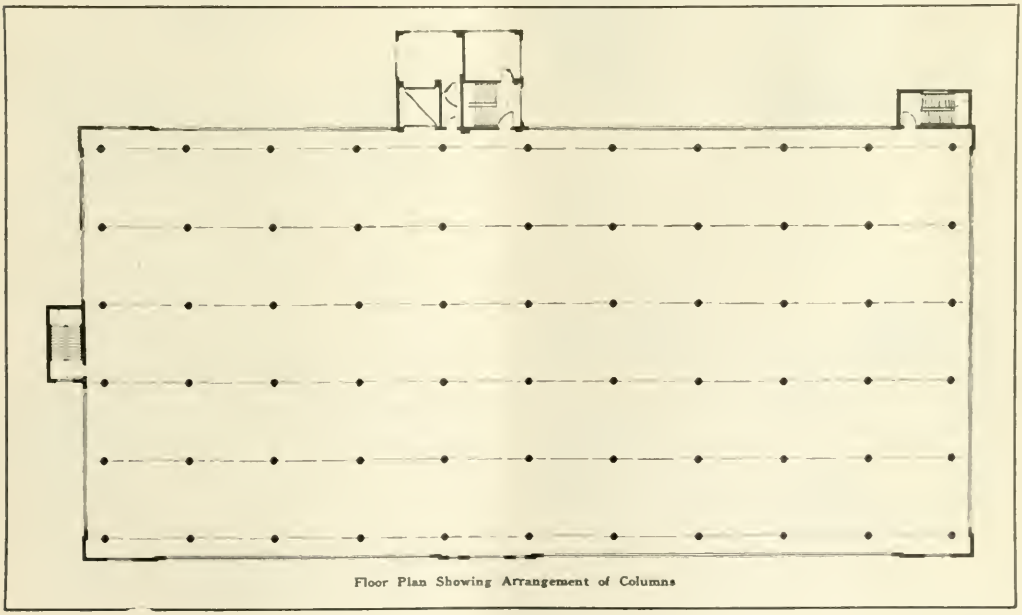
Another advantage resulting from the omission of the exterior wall columns and their corresponding projections on the inside of the building is that the installation of work benches, machinery and other equipment as well as placing the radiators for the heating system is greatly facilitated as all the various jogs are eliminated.

It is certainly a new departure in industrial construction. This building is now under construction and rapidly nearing completion. It is expected that it will be ready for occupancy by February 1st, 1923. The floor plan shows the location of the different columns, in the length of the structure they are placed 24 feet on centers and in the width 22 feet on centers.

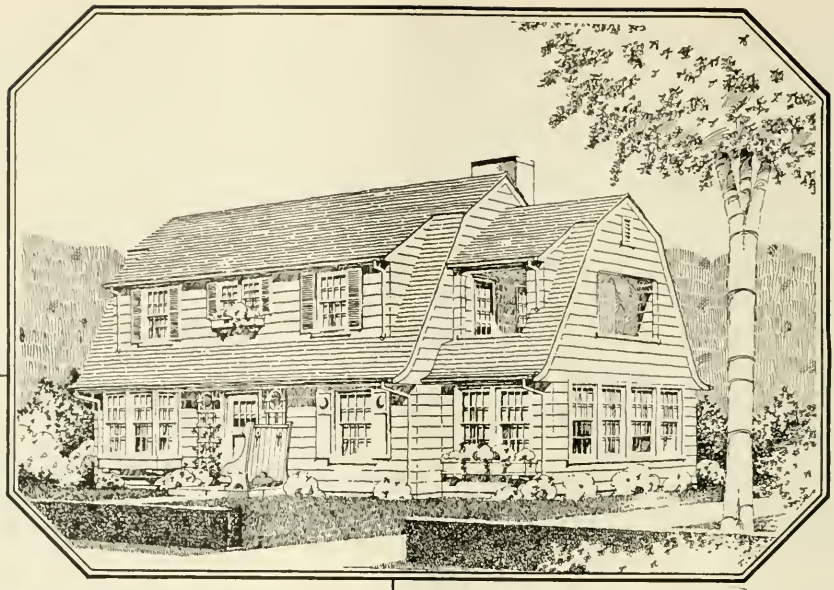


Sectional View

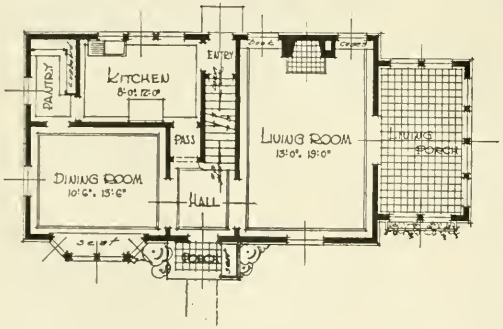
It will be noted that all the stairways are placed on the exterior of the building proper. Three separate stairways are provided so that there is ample safeguard for rapid escape in case of an emergency. Toilet rooms are placed on each floor in the rear extension.



Floor Plan Showing Arrangement of Columns

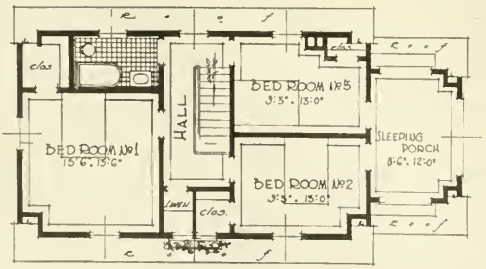


Novel Arrangement of Sleeping Porch and Living Porch Are the Special Features of This Clever Dutch-Colonial Design



FIRST FLOOR PLAN

SCALE OF FEET
0 5 10 15



SECOND FLOOR PLAN

Comfortable Home With Attractive Porches

THIS house has been designed for comfortable living. The architects have so arranged the plans that the housework can be done with ease. Note the arrangement of the kitchen with relation to the rear entry, cellarway, pantry and dining room; all can be reached with but a very few steps, this also applies to the front door, a call at this point does not require one working in the kitchen to pass a long distance through main rooms.

The dining room has a large bay window on the front that gives a pleasant outlook. The living room has a generous open fireplace with bookcases on either side under the windows.

The striking feature of the plans is the porches. The architects have solved the problem of the living porch and the sleeping porch in an admirable manner, so they are not only livable, but add to the exterior appearance of the house as well.

The porches are placed in a wing at the end of the main house, this gives three sides exposed for the porches—plenty of air and sunshine—and the roof of this extension has been designed to harmonize with the main roof.

Too often sleeping porches are simply "stuck" on the houses, giving the appearance of a sanatorium; which has been the reason why so many people have given up the idea of a sleeping porch. The living porch is completely enclosed with sash and screens, so it becomes an all year around room.

The second floor provides three nice bed rooms, a bath room and ample closets, all conveniently arranged about the center hall. The hall has a large window that gives light directly on the stairs, just where it is most needed.

Specially Designed for

BUILDING AGE
and
THE BUILDERS' JOURNAL

Together with
Constructive Details

by R. C. HUNTER & BRO.
Architects New York

The interior should be carried out in the Colonial style to harmonize with the exterior.

A cellar, providing the laundry, heater and coal spaces, etc., extends under the entire house

The exterior of this house is attractive, every detail has been well designed and the general proportions are good. The graceful Dutch roof lends charm. The house is, throughout, true to the best Colonial traditions. The estimated cost of the construction is about $8,000.

Quantity Survey *of* Comfortable Home

Shown on Preceding Page

THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items as sheathing, flooring, etc., are net areas to be covered, with no allowance for matching, waste, etc. Minor cuts have been disregarded.

Such items as clearing site, temporary work and protection, scaffolding and general equipment and supplies have not been included.

Such items as are marked "Unit," are to be estimated in a lump sum, following requirements of plans and specifications.

Excavation

(Excavation for pipe trenches not included)

Excavation for cellar	240 cu. yds.
Excavation for footings	13 cu. yds.
Excavation for areas	4 cu. yds.
Excavation for trench walls	9 cu. yds.
Excavation for leader drains and dry wells	12 cu. yds.
Backfilling around walls, etc.	35 cu. yds.
Leader Drains and dry wells—	
Field stone for dry wells	10 cu. yds.
4 in. salt glazed tile drain pipe	36 lin. ft.
4 in. elbows	6

Masonry

Concrete for cellar walls	770 cu. ft.
Concrete for footings	178 cu. ft.
Concrete for trench walls	126 cu. ft.
Concrete for area walls	84 cu. ft.
Cellar floor (3 in. concrete and 1 in. cement finish)	595 sq. ft.
Area bottoms (brick and sand)	32 sq ft.
Porch floors (12 in. cinders, 3 in. concrete and brick finish)	40 sq. ft.
(concrete without cement ft)	123 sq. ft.
Concrete forms	2100 sq. ft.
Pointing cellar window sills	14 lin ft.
Common brickwork for chimney (or 19 M.)	93 cu. ft.
Face brick for fireplace hearth and jambs (or 105 brick)	15 sq ft.
Fire brick for fireplace (or 75 brick)	15 sq ft.
8 in. x 12 in. T. C. flue lining	54 lin ft.
3 in. bluestone chimney cap (1 ft. 10 in. x 2 ft. 8 in.)	1

Mason's Iron Work

Fireplace damper (2 ft. 8 in. opening, with throat, etc.)	1
C. I. ash dump	1
C. I. cleanout door for ash pit (16 in. x 12 in.)	1
C. I. cleanout door for boiler flue (8 in. x 8 in.)	1
Thimble for boiler flue	1

Plastering

Three coat Patent plaster on metal lath, gross	640 sq. yds.
(Net 590 sq. yds.)	
G. I. corner beads	100 lin ft.

Tile Work

Tile work for bath room—	
Floor (1 in. hex. white)	47 sq ft.
Wainscot (3 in. x 6 in. white wall tile)	100 sq. ft.
6 in. sanitary base	25 lin. ft.
Moulded cap	25 lin. ft.
Living Porch floor—	
6 in. x 6 in. quarry tile	123 sq. ft.

Sheet Metal Work

Copper flashing for roofs, sleeping porch floor	222 lin ft.
Copper flashing and counterflashing for chimney	9 lin. ft.
Copper chimney cricket	5 sq. ft.
Canvas floor for sleeping porch	98 sq. ft.
4 in. half round, hanging gutter	168 lin ft.
3 in. x 4 in. leaders	90 lin ft.
Bends for leaders	24
Gutter thimbles	12
3 in. x 4 in. G. I. gas range vent	21 lin ft.
Cap and thimble for same	1

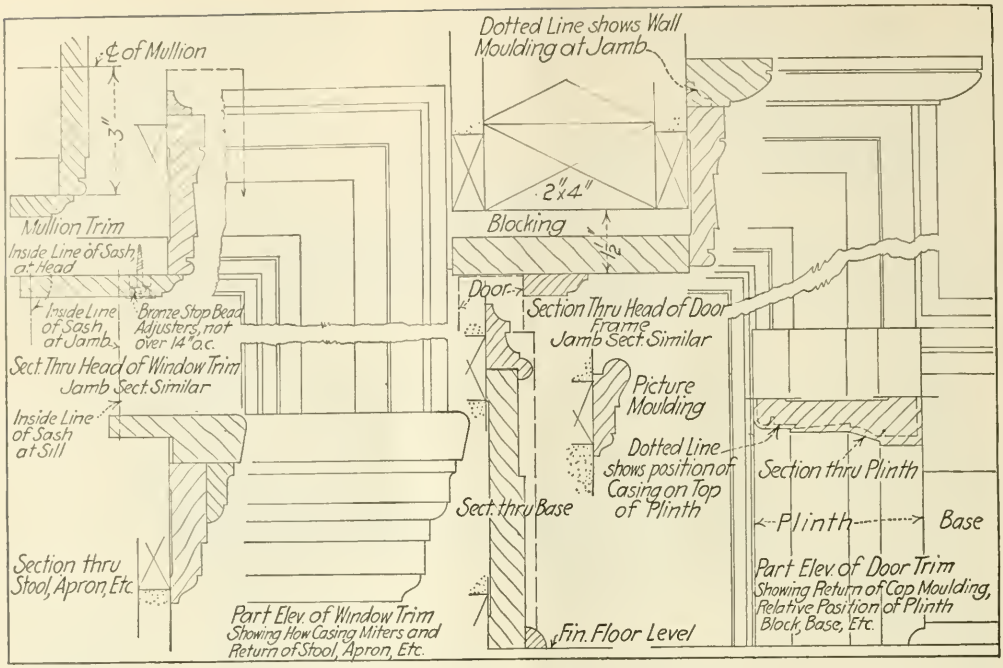
Carpentry

TIMBER

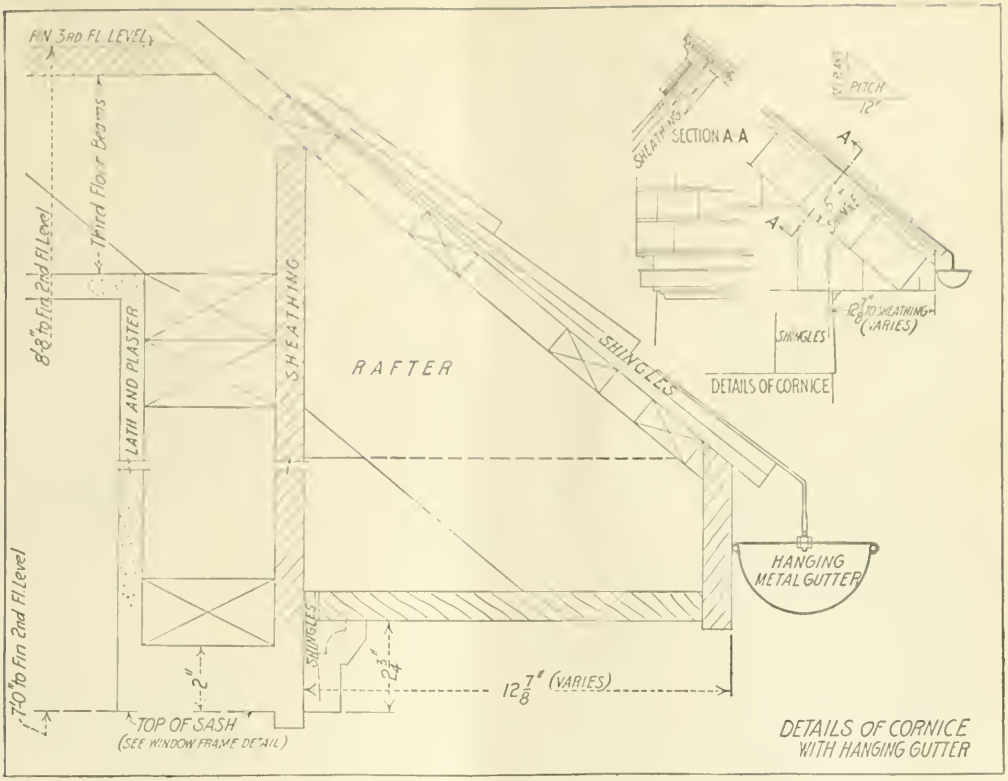
All No. 1 common stock hemlock rough unless noted

Cellar girders—	
6 in. x 10 in. spc.—2/12, 1/10, 1/8	210 F. B. M.

BLUE Print Plans and Specifications of many Beautiful Homes of Moderate Cost can be supplied at a nominal price by Building Age and the Builders' Journal, 912-920 Broadway, New York.



Cellar girder—Continued		
3 in. x 10 in. spc.—2/8	40	F. B. M.
2 in. x 3 in. nailer—94 lin. ft	47	F. B. M.
Sills—		
4 in. x 6 in.—4/18, 1/16, 2/12, 4/10	304	F. B. M.
Posts—		
4 in. x 6 in.—10/10, 1/8	216	F. B. M.
Studs, girts and plates, first floor—		
2 in. x 4 in.—210/8	1150	F. B. M.
Studs, etc., second floor—		
2 in. x 4 in.—240/8	1280	F. B. M.
First floor joists—		
2 in. x 10 in.—24/14, 7/12, 14/8	886	F. B. M.
Second floor joists—		
2 in. x 10 in.—31/14, 4/12, 23/10	1187	F. B. M.
Second floor ceiling beams		
2 in. x 6 in.—32/14	448	F. B. M.
2 in. x 4 in.—10/10	67	F. B. M.
Rafters—		
2 in. x 6 in.—52/12, 6/10, 10/8	764	F. B. M.
Ridge—		
2 in. x 8 in.—3/12, 1/10	62	F. B. M.
2 in. x 6 in. rafters (cut to rad.)—50/4	40	F. B. M.
Floor bridging—		
2 in. x 2 in.—350 lin. ft	117	F. B. M.
Cornice outlookers—		
2 in. x 4 in.—200 lin. ft	133	F. B. M.
Cellar partition studs—		
2 in. x 4 in—8/8	43	F. B. M.
Sheathing (7/8 in. x 8 in. shiplap), no outs—		
Walls—to cover	2150	sq. ft.
Sleeping porch floor, etc	140	sq. ft.
Sheathing paper (waterproof)	2200	sq. ft.
Shingle lath—7/8 in. x 2 in	3560	lin. ft.
Grounds—		
3/4 in. x 2 in. surfaced one side	2000	lin. ft.
Sheathing for cellar partitions—		
7/8 in. x 8 in. shiplap—to cover	90	sq. ft.
Rough flooring—		
7/8 in. x 8 in. shiplap (1st floor)—to cover	650	sq. ft.
Furring—7/8 in. x 2 in.	200	lin. ft.
Shingle roofs (18 in. stained shingles)		
14 squares	9560	shingles.
Shingle sides (24 in. stained shingles)		
18 squares	6000	shingles.
Exterior Finish		
Watertable (7/8 in. x 2 in. strip)	136	lin. ft.
Main cornice—		
7/8 in. x 4 in. fascia	170	lin. ft.
1 in. cove	170	lin. ft.
5/8 in. x 4 in. M. & B. ceiling (to cover)	160	sq. ft.
Raking cornice—1 in. x 1 1/2 in. cove	158	lin. ft.
Entrance porch—		
Seat, 3 ft. 1 in. long x 4 ft. high, with back, etc.	1	
Lattice panel, 1 ft. 6 in. x 7 ft. 10 in.	2	
Sleeping porch—		
5/8 in. x 4 in. M. & B. ceiling—to cover	102	sq. ft.
7/8 in. cove	42	lin. ft.
8 5/8 in. x 1 3/4 in. x 8 ft. plank sill	1	
8 5/8 in. x 1 3/4 in. x 6 ft. plank sill	2	
7/8 in. cove	20	lin. ft.
Flower boxes—		
(1 1/8 in. stock, zinc lining, etc.)		
12 in. x 12 in. x 7 ft. 6 in.	1	
12 in. x 12 in. x 4 ft. 8 in.	1	
Sawed wood brackets	6	
Lattice panel—4 ft. x 4 ft. 8 in	2	
Louvres—		
1 1/8 in. fixed slats, frames, outside trim, etc. Wire screen on back. 8 in. wide x 1 ft. 6 in. high	2	
Windows—		
Frames complete with sash, outside trim, etc.		
Sash, 1 1/2 in. thick, glazed D. T.		
Cellar windows—Trim both sides.		
Single top hung casem. sash, 3 ft. x 2 ft.—4 light	5	



First floor windows—
- Single D. H. sash, 3 ft. 6 in. x 4 ft. 10 in.—20 light 1
- Mull. D. H. sash, ea. 2 ft. 10 in. x 4 ft. 10 in.—16 light 2
- Group of 4 D. H. sash, ea. 2 ft. 10 in. x 4 ft. 10 in.—16 light 1
- Triplet D. H. sash, ea. 2 ft. 6 in. x 3 ft. 2 in.—12 light 1
- Single D. H. sash, 2 ft. 10 in. x 2 ft. 6 in.—16 light 2
- Mull. D. H. sash, ea. 2 ft. x 4 ft. 10 in.—12 light 1
- Single D. H. sash, 1 ft. 8 in. x 4 ft. 10 in.—12 light 2
- Single D. H. sash, 3 ft. x 3 ft. 2 in—16 light 2

Second floor windows—
- Single D. H. sash, 2 ft. 6 in. x 3 ft. 2 in.—12 light 1
- Single D. H. sash, 2 ft. 10 in. x 4 ft. 8 in.—16 light 5
- Mull. D. H. sash, ea. 1 ft. 8 in. x 3 ft.—12 light 1

Attic windows—
- Single casm. sash, 3 ft. 2 in. x 1 ft. 7 in., half circ 1

Shutters—
1 1/8 in. thick, solid paneled.
- 3 ft. 6 in. x 4 ft. 11 in. pr ..... 1 pr
- 2 ft. 6 in. x 3 ft. 3 in. pr ..... 1 pr
- 3 ft. 0 in. x 3 ft. 3 in. pr ..... 2 pr

Blinds—
1 1/8 in. thick, fixed louvres, etc.
- 2 ft. 6 in. x 3 ft. 3 in. pr ..... 1 pr
- 2 ft. 10 in. x 4 ft. 9 in. pr ..... 5 pr
- 3 ft. 4 in. x 3 ft. 1 in. pr ..... 1 pr

Exterior door frames—
1 3/4 in. thick, rabbeted, complete with outside trim.
- Front ent. door, frame, 3 ft. x 7 ft. .. 1
- Frame for doors to sleeping porch—2 ft. 6 in. x 6 ft. 8 in 2
- Frame for rear ent. door, 2 ft. 8 in. x 7 ft. 1

Exterior doors (all to detail).
- Front ent. door, 3 ft. x 7 ft. x 1 3/4 in. glazed D. T. and paneled 1
- Doors to sleeping porch, 2 ft. 6 in. x 6 ft. 8 in. x 1 3/4 in. glazed D. T. .. 2
- Rear ent. door, 2 ft. 8 in. x 7 ft. x 1 3/4 in. glazed D. T. and paneled. 1

Finished flooring—
- First and second stories, 7/8 in. x 2 1/4 comb. grain Y. P.—to cover. 1160 sq. ft.
- Lining paper under floors ..... 570 sq. ft.

Slat floor under laundry tubs, 3 ft. x 4 ft. 1

Cement filled pipe cols. in cellar, 4 in. dia. x 7 ft. 6 in. long, with cap and base 6

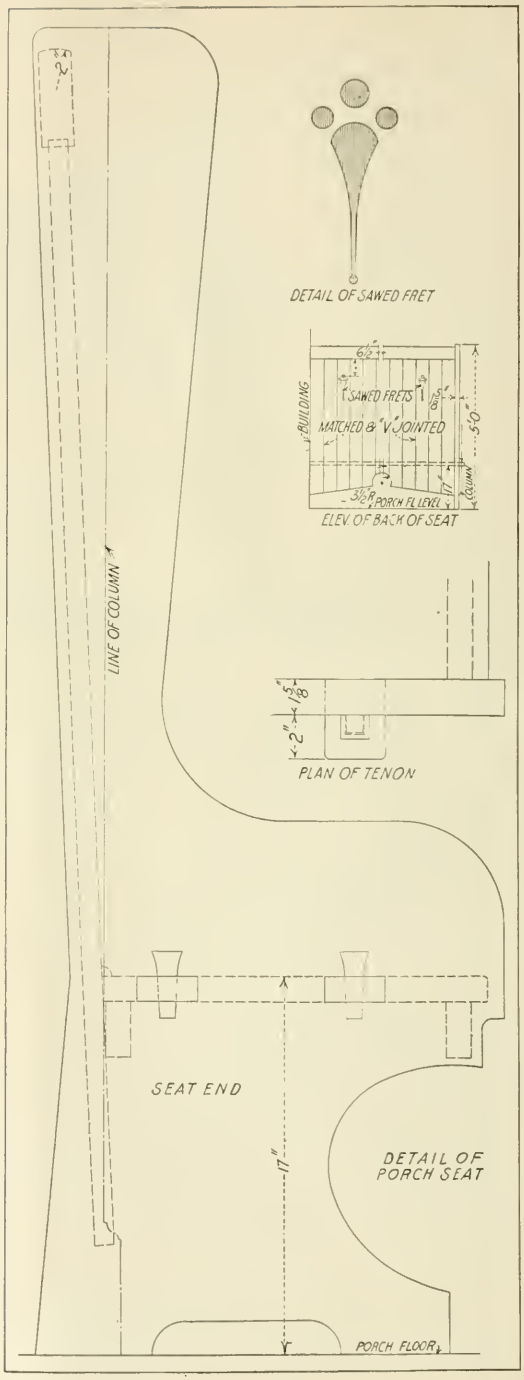
Joist hangers (1/4 in. x 2 in. W. I.)—
- For 2 in. x 10 in. beams 6
- For 4 in. x 10 in. beams 6

Interior Finish

Door trim—
7/8 in. jambs, 1/2 in. stops, 7/8 in. x 4 1/4 in. moulded and mitered trim. Trim both sides.
- For doors, 2 ft. 6 in. x 6 ft. 10 in.. 4 sets

Interior Finish—Continued

Door trim—	
For doors, 2 ft. 4 in. x 6 ft. 10 in..	1 set.....
For doors, 2 ft. 6 in. x 6 ft. 8 in...	4 sets.....
For doors, 2 ft. 4 in. x 6 ft. 8 in...	4 sets.....
For doors, pr. ea., 2 ft. 4 in. x 6 ft. 10 in.	1 pr.....
Trim for inside of exterior doors—	
Front entrance, 3 ft. x 7 ft.....	1 set.....
Rear entrance, 2 ft. 8 in. x 7 ft....	1 set.....
Doors to sleeping porch, 2 ft. 6 in. x 6 ft. 8 in.....	2 sets.....
Trimmed openings finished same as for doors—	
Opg. 4 ft. x 6 ft. 10 in.....	2 sets.....
Arch openings—	
Opg. 2 ft. 4 in. x 7 ft.....	1 set.....
Window trim—	
7/8 in. x 4 1/4 in. moulded and mitered trim.	
1/2 in. stops, 1 1/8 in. moulded stool, 7/8 in. moulded apron, 5/8 in. x 7/8 in. cove under stool.	
For windows, single, 3 ft. 6 in. x 4 ft. 10 in.....	1 set.....
For windows, mull. ea., 2 ft. 10 in. x 4 ft. 10 in.....	2 sets.....
For windows, group of 4, ea., 2 ft. 10 in. x 4 ft. 10 in.....	1 set.....
For windows, triplet, ea., 2 ft. 6 in. x 3 ft. 2 in.....	1 set.....
For windows, single, 2 ft. 6 in. x 3 ft. 2 in.	1 set.....
For windows, single, 2 ft. 10 in. x 2 ft. 6 in.....	2 sets.....
For windows, mull., ea., 2 ft. x 4 ft. 10 in.	1 set.....
For windows, single, 1 ft. 8 in. x 4 ft. 10 in.....	2 sets.....
For windows, single, 3 ft. x 3 ft. 2 in.	2 sets.....
For windows, single, 2 ft. 10 in. by 4 ft. 8 in.....	5 sets.....
For windows, mull, ea., 1 ft. 8 in. x 3 ft.....	1 set.....
Base—	
7/8 in. x 6 1/2 in. moulded.....	390 lin. ft.....
7/8 in. x 4 in. plain (closets).....	60 lin. ft.....
2 in. base mould.....	390 lin. ft.....
1/2 in. quarter round floor moulding.	450 lin. ft.....
Picture moulding (7/8 in. x 2 1/4 in.)	360 lin. ft.....
Mantel for living room, with paneled breast	1 unit.....
Bookcase for living room, 3 ft. 8 in. x 4 ft. 6 in.....	2 units.....
Seat for dining room, 2 ft. x 9 ft., fixed top	1 unit.....
Interior doors—	
Two-cross panel, birch veneer.	
Door, 2 ft. 6 in. x 6 ft. 10 in. x 1 1/2 in.	4 .....
Door, 2 ft. 4 in. x 6 ft. 10 in. x 1 1/2 in.	1 .....
Door, 2 ft. 4 in. x 6 ft. 8 in. x 1 1/2 in.	4 .....
Door, 2 ft. 6 in. x 6 ft. 8 in. x 1 1/2 in.	4 .....
Glazed D. T.	
Pr., ea., 2 ft. 4 in. x 6 ft. 10 in.....	1 pr.....
Scuttle to attic—	
2 ft. 6 in. x 3 ft., with trim, etc.....	1 .....
Closet finish—	
Closet shelving (7/8 in. x 12 in. pine)	30 lin. ft.....
Hook strip (7/8 in. x 4 in.).....	46 lin. ft.....
Rabbeted shelf cleat.....	20 lin. ft.....
1 in. dia. pipe clothes rod.....	14 lin. ft.....
Pantry cupboard—	
Front, 7 ft. x 8 ft., counter-shelf, drawers, doors, etc.....	1 unit.....
Main stairs, first to second story, 14 risers, 3 ft. wide, box pattern, balustrade at second floor, etc.....	1 flight.....
Cellar stairs, 12 risers, 3 ft. wide, box pattern, wall handrail, etc.....	1 flight.....



Let Us Think that We Build Forever, *or the* Present Magnitude *of the* Building Industry

By H. A. BRICE

IN a talk before the Birmingham, Ala., Kiwanis Club the author stated that few are aware of the magnitude of the great construction industry and what it represents. Reliable data recently compiled show it to be second only to that greatest of all industries, agriculture.

It has been called the key industry in that it unlocks practically all of our activities and resources. It reaches into the mines and forests and into a multitude of factories, and draws from them the raw material and finished products which are wrought into buildings and other construction enterprises.

Approximately 90 per cent. of all iron ore, copper, zinc ore and 95 per cent. of lead production are consumed by construction. About eleven million persons, either as workers or as members of workers families, derive their living from construction. The support given to agriculture and trade by the annual expenditure of this great number of persons is too apparent to require discussion.

The value of new capital issues during 1920, so far as data have been reported, reaches the high figure of four and one-half billion dollars, consisting of State, municipal, railroad and industrial securities; and of this total approximately 60 per cent. were issued for construction in some form or another.

While it is true that the builders who handle the final assembling of materials represent only a limited part of this industry, they may be likened to the keystone of the arch. On them depends the great responsibility for safeguarding the industry and the nation.

Looking into the future of construction we seem to be faced with a situation unparalleled in its history. Aside from the development we might expect from the normal growth of this country and the great highway building program now under way throughout the country, we have an accumulated shortage resulting from that period of restricted building during the war when the industry was practically at a standstill. It has been conservatively estimated that it would require approximately ten years to catch up this shortage.

> WHEN we build, let us think that we build forever. Let it not be for present delight nor for present use alone. Let it be such work as our descendants will thank us for; and let us think, as we lay stone on stone, that a time is to come when those stones will be held sacred because our hands have touched them, and that men will say, as they look upon the labor and wrought substance of them, "See! This our father did for us."—John Ruskin.



The Memorial Arch at Valley Forge in Honor of the Patriots Whose Efforts and Sacrifices Made Possible Our United States. Let Us Be Grateful This Coming Thanksgiving Day That "They Did Build Forever"

For the period including from about the first of the year 1915 until the beginning of the present year, if one were to plot a curve representing the average change in construction costs, he would find that the line would rise gradually, though with periods of fluctuation, until about the middle of 1920, when it would reach a peak at approximately 250 per cent. above the level at which it began. From that date a more rapid descent takes place until the fall of 1921, when general business conditions began to improve. From that time up until the present, the line maintains practically a level.

In the face of the fact that at the present time many of the larger cities are announcing building programs for the coming months that are staggering to contemplate, it would seem hardly possible for one to expect further decline in construction costs within the near future.

The activities of our company are devoted mainly to building construction. We have our problems from day to day in common with every other business enterprise. But it has been our earnest effort at all times to give to every obligation, whether it be a contract for a store front, alteration involving a few hundred dollars or a monumental building costing hundreds of thousands, the last ounce of effort toward the single aim—a duty well performed.

There is one thing about the Kiwanis Club which has always impressed me very much; that is the slogan, "We Build." The spirit back of this slogan is the spirit which we endeavor to instill into our work in such a manner that we may be able to quote the words of John Ruskin.



Colonial Architecture Lends Character *to* Modern Bank

ARTHUR H. BROCKIE, Architect

WELL designed bank buildings are in demand in even our small cities. A bank building in every detail must typify the strength, dignity and stability of the institution it houses. In a way, its quarters must be more or less in keeping with the surrounding traditions and customs.

Quite often the architecture adopted for the bank building follows the style for which the district is more or less famed. What could be more appropriate for a Pennsylvania bank than to follow out the lines of its old buildings known to us as the Dutch Colonial style?

The interesting bank design shown here is that of the Chestnut Hill Title and Trust Company building in Philadelphia and in its construction stone was used from a nearby quarry. The architect has faithfully carried out the exterior details along the lines of some of the older buildings that have made Pennsylvania famous for its dignified architecture.

The interior planning of this bank deserves special mention. When one enters from the vestibule,



Grey Stone and White Trim Produce a Very Pleasing Exterior



Observe Large Detail of the Entrance on Opposite Page

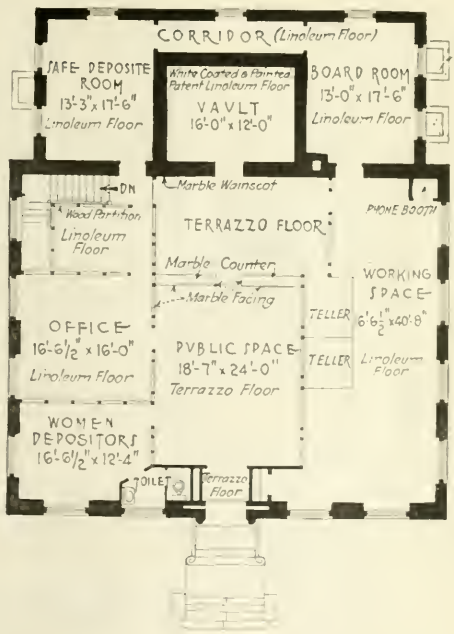
practically the entire bank interior is in view, disclosing a large open space, well lighted by windows on three sides. Directly opposite the front entrance is the entrance to the safe deposit vault. This is located in sort of an extension built in the rear of the main structure. The different office space is railed off into smaller compartments by marble counters.

The area devoted to use of paying and receiving teller, etc., has an additional bronze and glass screen on top of the marble counter. A special section has been railed off especially for women depositors and off this is a small toilet room.

All of the public space is floored with terrazzo laid on a concrete base. The balance of the concrete floors are covered with linoleum cemented down so that it is an integral part of the floor just the same as though it were wood. Here the bookkeepers, etc., are assured of plenty of daylight while at work. In the rear, on one side of the vault, is located a good sized room for board meetings and on the opposite side a room of the corresponding size is specially devoted to the use of the safe deposit customers.

The entrance itself is interesting in detail but very dignified and artistic. A hanging lantern overhead illuminates the steps at night. A well designed cornice with brackets supporting the overhang surrounds the main portion of the building. The roof on the main portion of the structure is of slate and the flat surface over the vault extension is of tin.

This building was erected from plans prepared by Mr. Arthur H. Brockie, architect, of Philadelphia, and was erected by J. C. Cornell & Son, building contractors of Philadelphia. The different views that we show of this building were taken by Mr. Philip B. Wallace, photographer, of Philadelphia.



The above floor plan shows the convenient arrangement of the interior of the Chestnut Hill Title and Trust Company, Philadelphia. A good size central space makes it convenient for the public to transact business with either the officers or tellers. Good, light working space is also provided as well as Board Room, etc.

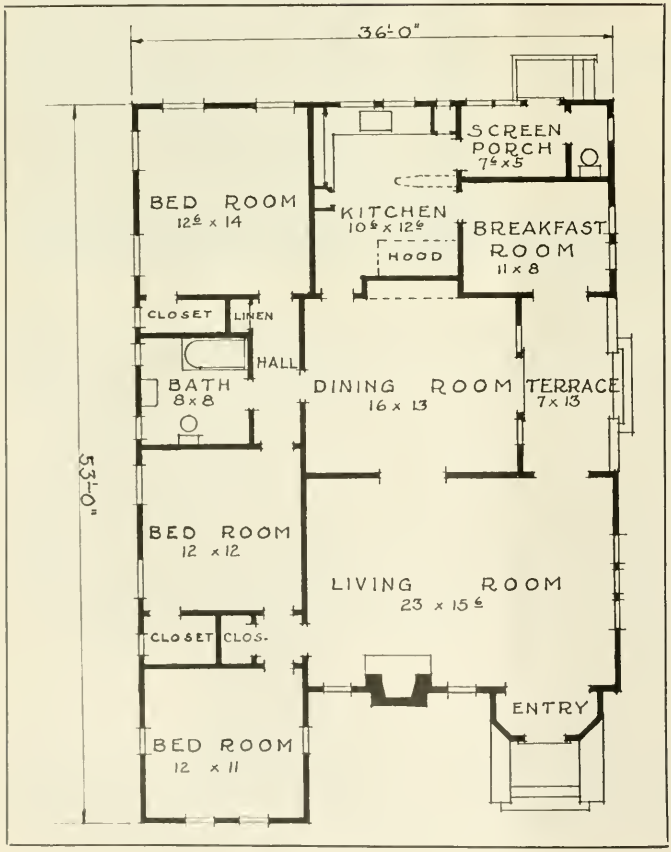
Attractive Bungalow *of* Seven Rooms

By CHARLES ALMA BYERS

THE steeped-roofed little house illustrated here commends itself to the interest of prospective builders in a number of ways. In the first place, it is uncommonly attractive in outward appearance, and it is, moreover, of a style architecturally to be practical for any climate.



Having seven rooms, it is a much roomier house than its dimensions of thirty-six by fifty-three feet lead one to expect, which means that the floor space is handled most economically. The interior is further arranged very conveniently, and there are many excellent closets and built-in features to win the especial delight of the housewife.



The steep roof with its ornamented peaks, the chimney prominently situated on the front, the octagon-like entrance extension and various other well-handled details, together with a very effective color scheme, all combine to make the street view of the little house particularly attractive.

In studying the accompanying floor plan, it should be especially noticed that but very little space is required for providing hallway connections, and yet all parts of the house are conveniently accessible. A possible change or two in the use of rooms also deserves to be brought to attention. The front bedroom, for instance, might be utilized as a den, and the little breakfast room would make either a very delightful sewing room or a play room for children.

The house has neither basement nor furnace. However, had either been desired, a stairway might have been substituted for the little toilet room on the rear-entry porch.

The heat is furnished by several built-in gas radiators, and every modern convenience is provided. The house is located in Los Angeles, California, and was designed by E B. Rust, architect, of that city.

Reducing the Cost *of* Building by Year Round Construction

WINTER work in the various departments of the building industry keeps the mechanics busy the year round and reduces the contractors overhead as it enables it to be distributed over more jobs.

A rather interesting work was recently undertaken by the New York Building Congress tending to initiate a program to reduce the cost of building by adding more seasons to the industry, thereby eliminating both the rush periods when bonuses are frequently paid and the periods of unemployment. A survey has just been completed analyzing the building situation. The findings are such that it is believed with the co-operation of all the elements contributing to the building industry a workable program can be put in operation that will be a material benefit to every phase of society from the laborer to the investor.

The congress conducted its investigation over a period of four months and the findings cover twenty-nine distinct occupations as affected by the average employment variation of upward of 150,000 workmen annually during the past ten years.

Recognizing that the basic factors in the seasonal demand are winter and weather conditions, opportunity for investment, general business tendencies and emergency needs, attention is being focused on new construction subject to control.

In summarizing its investigation the congress finds that custom is really the biggest influence in causing the peak loads on the demand for labor, especially during the renting seasons. Careful business foresight is what is needed more than anything else to effect lower costs, with less waste, higher quality of workmanship and greater production, according to the reports.

It is pointed out that investment and speculative construction on new buildings classifies itself in general into three main divisions: Apartment houses, commercial buildings and loft buildings. The periods for renting these types of construction are based largely on custom and tradition, and have an important bearing on labor demand. Large apartments are commenced so as to allow twelve or fourteen months for completion, the finished buildings to be ready for occupancy by October 1, which custom has decreed is the moving season for residents of New York City.

THE general recommendation is for the Owner, Investor, or Representative to place Building Trades work to include the heretofore dull periods of employment.

This will reduce non-productive expense and waste, and increase production, as a result of having skilled help available instead of relying on incompetent workmen.

It will eliminate excessive labor expense, lower the cost of materials, and decrease the contractor's margin of profits as he prefers to keep his organization in employment as steadily as possible.

The advantages are many and the benefits go to the community generally, being incidental in their value to labor, employer, and owner.

Commercial buildings usually call for commencing work on May 1 and completion on or before the following May. Loft buildings are often built in six, eight or nine months, and have a strong demand for occupancy on February 1.

Thus one of the vital factors in the new construction is the established rental period. It is also important to remember that the volume of building in the three types of new construction above mentioned varies from year to year, due to the opportunity for investment and the supply and demand, so that one year of large development in any one division may be followed by a decline in volume the next, and vice versa.

THE new construction most subject to control aside from construction for investment and speculative purposes is the large amount of building done for the Government, State and city. This can be open to regulation by the governing boards in control of their development. Religious and educational structures are also a factor and new buildings and additions that are erected for the owners' prearranged occupancy without regard for investment or speculative returns are important.

In prefacing a detailed statement of recommendations for adding more seasons to the building trade, the New York Building Congress Bulletin states:

"While the congress feels fully aware of the fact that an entire cure for seasonal employment is impossible on account of weather conditions, opportunity for investment, emergency and the will of the owner and speculator, still the opinion is general that much can be done to adjust elements that affect peak demands and as a result decrease much of the unnecessary cost and loss to which the building industry is now subjected.

"With this understanding the following recommendations are made in hope that they will be suggesting to owners, investors, real estate brokers, architects, engineers, material manufacturers, contractors, labor and others who may be interested in reducing costs and eliminating unemployment periods:

"1. Establish a wider range of rental period dates.

"2. Regulate Government, State city, religious and educational building construction so that it will come during the low period of employment wherever possible

"3. Regulate the construction of new buildings and additions that are erected for owners' prearranged occupancy without regard for investment returns so that it will come during the low period of employment.

"4. Encourage beginning work on new construction March 1 instead of the customary date of May 1, thereby bringing its labor demand two months ahead of the demand peak, with a greater supply available.

"5. Plan maintenance and repair work so that it will come during the season for which there is a low demand for the labor involved, subject to emergency conditions that must be considered.

"6. Whatever possible, adapt the demand for 'inside' and 'outside' work to labor available."

The committee framing the above resolutions, which have been unanimously adopted by the New York Building Congress, includes Charles E. Mack, of Mack, Jenny & Tyler; Walter Roberts, chairman, William Bradley & Son; Fitz-Henry Faye Tucker, of Renwick, Aspinwall & Tucker; Roswell D. Tompkins, New York Building Trades Council; H. H. Watters, Otis Elevator Company, and Frank L. Glynn, managing director, Apprenticeship Commission of the New York Building Congress, Grand Central Terminal, New York.

What *Are* Building Costs?

The Contractor as a Manufacturer

By A. P. GREENSFELDER
Fruin-Colnon Contracting Co., St. Louis, Mo.

PEOPLE frequently discuss building costs as if bricks and bricklayers, materials and labor were the only items worthy of consideration. Broadly speaking, men and materials do comprise the total expense in construction work, just as they do in any other article produced for civilized man.

What we wish to emphasize, however, is that most people really think that the walls and floors of a building, the visible completed objects, are the only costs that enter into the expense of erection. They think differently, however, when they find it necessary to buy a stick of wood at the lumber-yard or a pair of hinges at a hardware store, which may be needed for an extra partition after they have moved into the new building.

From their own books business men know just the sort of expense items they must add to the cost for fixed charges, operating expense and legitimate profits. They understand that their selling prices must include rent, taxes and insurance, contingency charges, interest and profits.

The builder is a merchant. He is also a manufacturer, differing from the usual producer in that the builder's factory is portable and frequently without a roof, at least until nearly the end of the job. The builder has a fixed office, a warehouse and yards for storage of machinery and materials. The annual upkeep of these adjuncts must be sustained by field construction executed during the year.

The builder also has selling expense. He must advertise and call upon architects, engineers and owners before he secures a customer. He must pay his estimator to make a quantity survey of the plans, because the owner does not tell him what he tells everybody else he buys from—the quantity of materials he wants to purchase. The builder's purchasing agent then locates the materials at market prices; and, after careful estimates are made, conferences held and a financier consulted, a contract is made with a future owner and the builder assumes the title and agency of a contract.

As agent, the contractor arranges to incur the following expenses: surety bonds, liability, fire and tornado insurance, building permits, water license, city inspection fee, temporary public utilities service, transportation of materials and drayage of equipment. Not a single item would be visible to a visitor to the building site, and yet they may constitute 10 per cent. to 15 per cent. of the cost. Then there is bank interest, because the owner does not advance money for payrolls and material bills. There is also ice and coal, oil, stationery, carfare, postage, rope, perishable tools, scaffolding, demurrage, war taxes and other miscellaneous items which are consumed.

On a job of any size at all, the contractor must provide labor-saving equipment, such as concrete mixers, steam shovels, derricks, hoisting machines, power saws and similar machinery. While they are truly labor-saving and produce economy, they cost about 4 per cent. of their value each month. Then, there is the greatest of intangibles, brains, which, mingled with experience, knowledge, good judgment, aptitude and industry, produce that supervision which makes for good results. Brains insure satisfactory service. This is represented in the contractor's organization in many ways. The ablest superintendent, for instance, makes the fewest mistakes, has initiative, plans his work ahead, keeps his men working cheerfully together and gets a quality job done ahead of time within the estimated cost. Such men earn good wages and are worth it. Every merchant and manufacturer knows how scarce leaders are.

Then appear such contingency items as frost, rain, labor strikes, railroad delays and accidents, many of which are common to most industries, but all of which frequently confront the contractor. The law of averages applies the proper charge on such items to the work. Finally, to the actual outlay for materials and labor must be added a remuneration for the contractor sufficient to induce him to remain in business, subject to hardships and risks, and yet keep his financial credit good enough to start the next job.

Do you still think men and materials embrace all building costs?

(Paper prepared for the Associated General Contractors of America.)

CONCRETE

Form Work-Reinforcing Methods Monolithic and Block Construction



Methods *of* Placing Concrete *in* Cold Weather

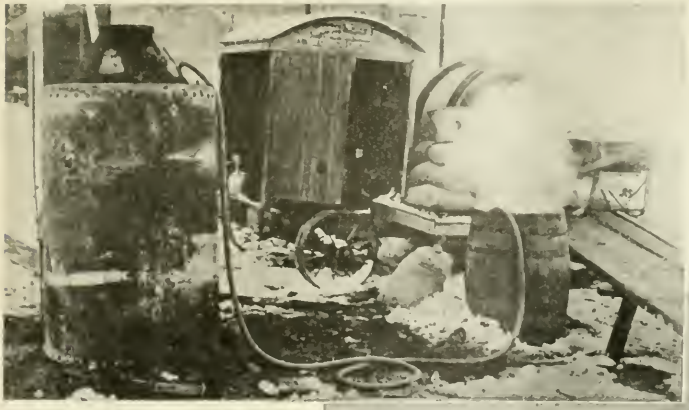
By A. J. R. CURTIS

NONE of the radical departures in building operations during the last few years carries greater economic possibilities than that of carrying on these operations continuously or nearly continuously throughout the year. Frequently, closing down for the winter means the loss of valuable time in the fall as well, because of the fear that work started in moderate weather may continue after cold weather sets in.

Most building materials are easier to procure in the winter and sometimes at lower cost. Labor is usually more plentiful and labor turnover is less. Winter interruption to his business often means that the contractor has to rebuild almost an entire trained organization—frequently including technical and superintending forces and fifteen or more different trades—every spring.

Winter construction costs are usually somewhat higher, but nearly always worth more than they cost to the owner, because his income or benefits from the structure start months sooner and to the contractor because he can complete the work, take out his payments and look ahead to the next job. The construction season is thus profitably lengthened for both owner and contractor.

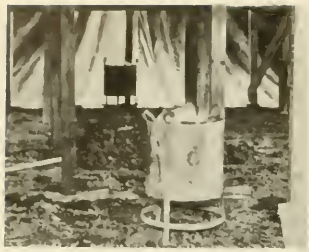
About the only important obstacle to winter construction has been the lack of an understanding and application of the relatively simple precautions necessary to successful winter concrete work. Much winter concreting has been done successfully during the past ten years and some of the largest and finest construction work of the war period was completed with the thermometer around the zero point.



An old boiler supplies steam to heat mixing water and aggregates and warms up surfaces of the forms



A concreting outfit ready for business, with the thermometer at eight degrees below zero. The steam boiler at the right furnishes power for the mixer, steam for heating the aggregates and boiling-hot mixing water



Slamanders furnishing heat within building shown below, which is protected with canvas covering

The contractor who carefully plans ahead can often complete all concrete portions of a job before severe cold weather sets in so that the remainder of the work may proceed regardless of outside temperature conditions. Concrete work started in October and November is usually subject to considerable economies, for concreting crews work most efficiently during moderate or cool weather.

Planning for Winter Concreting

The contractor who expects to undertake building work likely to involve placing of concrete in freezing weather will do well to arrange as early as possible for necessary supplies of sand, gravel and stone. Rail priorities given to facilitate the movement of coal have already made it difficult to obtain cars for the movement of concrete materials and this situation can hardly be expected to improve until coal requirements have been taken care of.

Gravel pits cannot operate in the winter and they are usually compelled to close down with the first hard freeze. Materials wet in transit and frozen in the car are difficult and expensive to thaw out and unload. These facts are stated to emphasize the importance of arranging early and carefully following up deliveries of concreting materials.



Hand mixing outfit within canvas enclosure using live steam for heating the water. A salamander heats the enclosure

Principal preparations for cold weather concreting consist of providing or conserving heat in the presence of sufficient moisture so that the concrete can harden uniformly and with reasonable rapidity. If concrete freezes, the hardening action stops, for the water, which must be depended upon to react with cement, has changed to ice and, as is well known, cement and ice do not react nor does concrete harden while frozen; but the formation of ice is accompanied by expansion which may spall or disfigure the surface of the work or interfere considerably with the strength.

For a period during the fall, the temperature at night may go down to freezing, although quite moderate or even warm during the day. It is usually possible under these and similar weather conditions to take care of concrete work satisfactorily by covering the work carefully in order to trap the heat present, when the concrete was placed, keeping out cold winds, rain and sleet. Even where the temperature does not go below freezing, covering the work is beneficial in hastening the hardening.



Sslamanders (coke stoves) arranged to heat a low wooden and canvas enclosure over a newly-placed sidewalk on a city street

Protective Coverings

The nature and duration of this protection depends upon the character of the work to be protected and prevailing temperature conditions. Every covering should be tight, to resist and keep out wind and water. Beware of holes, tears or openings of any kind and be particularly careful to amply protect exposed protruding portions of the work.

Contractors generally prefer tarpaulins as the most adaptable covering for concrete work of various kinds, large and small. Tarpaulins may also be effectively

used to cover exposed piles of aggregates. Wooden housing makes the most substantial covering for whole buildings, floors of buildings, small and moderate size bridges and similar work, and where the expense can be justified or compensated by re-use of the lumber, it is commonly preferred.

Straw or manure is commonly used around low forms and for foundations and low walls. Manure must not touch freshly placed concrete. Building paper, where it can be properly supported, is an efficient protection against cold winds and is used over walks and floors, frequently carrying a covering of straw or manure.



Sections of a discarded smoke stack in use on the Chicago Union Station job for heating aggregates

Heating the Mixing Water

When it becomes necessary to impart heat to the concrete in order to have it come through the first 48 hours at a temperature of 50 degrees or more which is recommended, heating of the mixing water is usually resorted to as the cheapest and easiest method. An effort is often made to deposit the concrete at a temperature of 80 or 90 degrees. To do this the water may be used at the boiling point. It may be well to observe that since it is only the water in concrete that freezes, a reduction of the mixing water somewhat from the quantities ordinarily used will be found beneficial.

The three most common methods of heating mixing water for concrete are as follows:

(1) By exhausting live steam in the water tank or barrel, a method which is adaptable wherever live steam is available;

(2) By running the water through a coil of pipe supported over a fire, perhaps the easiest arrangement where there is running water but no live steam, and

(3) By the use of kettles or tanks supported over a fire—suitable where neither live steam or running water can be obtained.



Several modern heating devices have been made available recently. This heater, in addition to its function as a salamander for keeping the enclosure warm where desired, contains a coil of pipe by means of which the water may be heated to a desired temperature

Heating Aggregates

As the weather grows colder it is even more desirable to get the concrete into the forms at high temperature and heating of the aggregates—sand and pebbles or stone—is usually the next of the progressive methods employed. Contractors are in a habit of heating these materials to from 100 degrees to 150 degrees, striving to



"Pipe heaters" in use showing the desirable method of keeping sand and pebbles in distinct piles. The materials should be turned frequently so that they will be heated uniformly



A new and practical apparatus is the kerosene heater, which keeps the mixer drum and its contents warm



Walks and floors and other low work are frequently protected by covering with heavy paper covered with straw. Heavy planks are used to weight the covering

is not used as frequently as formerly, experience appearing to show that where steam is available it is more efficient and convenient to supply the heat through a grid of steam pipes, laid upon the floor where the aggregates are piled. In this case the pipes do not exhaust the steam into the pile, but simply supply heat in the same manner as an ordinary steam coil. Tarpaulins are frequently used to cover the pile and retain the heat.

Cement forms a relatively small portion of the bulk of a concrete mixture and, therefore, need not be heated. It should be stored where well protected from moisture and extreme cold. Never depend upon the heat generated by the action between cement and water. It is inconsiderable.

Some Other Suggestions

In extremely cold weather heat is frequently supplied at the mixer. This has been done by exhausting steam in the mixer drum and providing the latter with "flaps" if necessary to retain the heat. Recently very efficient kerosene torches have been introduced for the same purpose. Location of the mixer and other details should be arranged so that concrete will be carried in the quickest possible time to the forms, and with the least exposure.

Immediately before filling each small portion of the form, the ice is removed if any be present. A steam hose is a great help in melting ice and warming form surfaces. In the absence of steam an ordinary blow torch may be used to heat the surface of steel forms.

Salamanders (coke stoves) and steam coils are the more commonly used pieces of apparatus for heating enclosures. A recently invented salamander having a water pan to provide moisture as well as heat in the enclosure is considered particularly efficient. Oil stoves and large lamps are quite frequently used on smaller work in rural districts where they are more easily accessible.

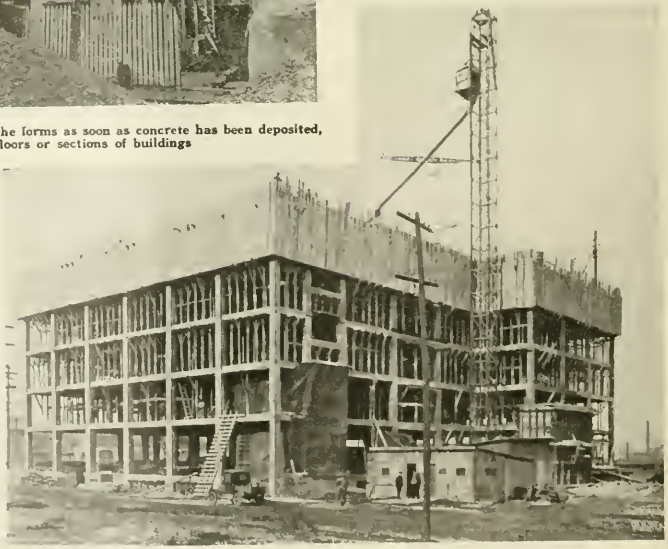


Large tarpaulins are very commonly used to cover the forms as soon as concrete has been deposited, or frequently to enclose entire floors or sections of buildings

deposit the concrete at 90 degrees or as near thereto as possible.

Fireboxes, made of sections of discarded smokestack, iron pipe or boilers, serve as efficient heaters, the materials being banked around them and turned occasionally to insure reasonable uniformity of heating. Some concrete contractors prefer to construct their heaters of steel plates laid on concrete blocks or similar supports, the materials being heaped on the flat plates from which it is easier to remove them.

Steam jets are occasionally used being long perforated pipes which are thrust into the piles and used as a means of exhausting steam into the materials. This apparatus



Wooden housing is frequently found economical on such large jobs as this and, in a few cases, entire buildings have been enclosed with wood. The material so used is employed several times, so that each use represents only limited investment in lumber



Railroad Sets Example in Beautifying Homes

By GEORGE A. BARCLAY

TWO ideas have animated the Grand Trunk Railway in beautifying the stations along its right of way in Canada and the United States. One is to make the station an ornament to the town in which it is located. The other is to furnish an example in landscape gardening and attractive building to rural owners of homes.

By carrying out these ideas, the railway has become recognized as a civic benefactor. For several years the road has had a few show stations in the larger towns. Here its stations were built with striking architectural effects and surrounded by patches of fairyland gorgeous with flowers, shrubbery and fountains. But in the last year the road has adopted a comprehensive plan for the beautifying of all its stations—a plan that makes the small towns and the cities alike sharers in beauty.

Distinct progress has been made in carrying out this plan. Waste land and cinder beds on which the stations stand have been transformed into green lawns and flower beds.

The amount of ground available around the stations was, as a rule, not extensive and nothing of an elaborate nature was attempted, the main object being to have some simple arrangement of lawn, shrubs and annual flowers in keeping with the general surroundings. In order to obtain results with the minimum of expense, the general land contour was not changed.

Considerable care was given to the collection of the shrubs and flowers as they were required to grow under conditions not conducive to the best of plant health. The work has been carried out entirely by the track forces and station staffs of the railway, and the fact that a large portion of the upkeep has been done by the men on their own time shows how they have supported the plan.

The men in charge of the various stations were supplied with the plants, and in the majority of cases they did their own arranging. The ultimate results of their work, as seen from the passing trains, were in every way satisfactory, and reflected great credit on the men, who, previous to the company's taking up the subject, had done little or no horticultural work. As there has been a marked awakening of interest in the improving of home surroundings, the work accomplished by the Grand Trunk employes in beautifying the railway premises will serve as an inspiration to the citizens of many towns in what can be done in a simple and inexpensive way in improving their own home grounds.

Besides neat and artistic grouping of shrubbery one can use lattice screens, pergolas, fences of wood, stone, brick or concrete, with neatly designed gates. All help to make the "home beautiful."

Usually the chicken house, woodshed, dog house, garage, etc., are eyesores. A few dollars spent for architectural advice will be well invited to obtain an artistic result.

Wash poles are usually no ornament to a lawn or landscape scheme, yet they can be made so—one pole can have a piece of lattice work with vine; another a bird house on top; another a part of a pergola, etc. It only costs a small amount to do these things, and they surely pay.



Even a Tool Shanty Can Be Attractive by Giving a Little Thought to the Design

Making Convenient New Homes from Old

A Woman's Idea of a Properly Electrically Equipped Home
A Profitable Line of Winter Work for Builders

By LILLIAN CASSELS
of the Society for Electrical Development

WINTER gives builders an opportune time of putting old houses through a process of revamping, and promises large returns in both profit to builder and pleasure to owners, and no one thing has such a bearing to comfort as a proper electrical equipment.

The profit accrues in transforming squalid buildings, melancholy and untenable in their present shabbiness, into property whose selling or renting values increase tremendously by reason of the small investment.

This has been done in many places. But not by any means to its fullest possibilities. Scarcely a city in the country does not contain street after street filled with houses which while sound at heart have been permitted to shed paint and paper and to grow generally disreputable for want of repairs.

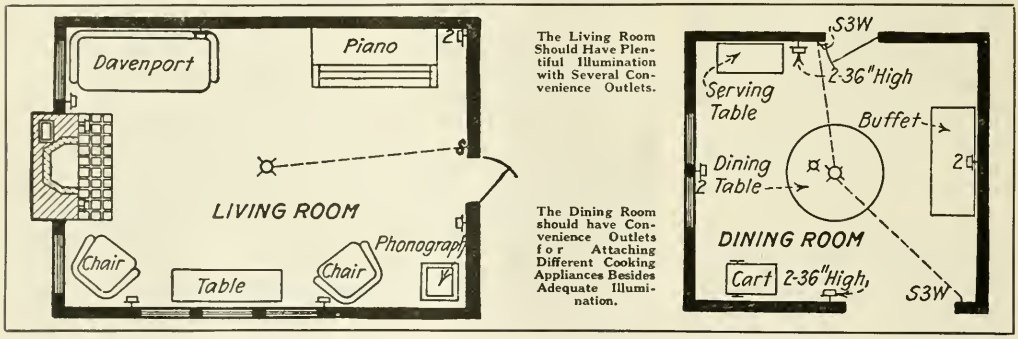
The vagaries of a growing city have in most instances made these neighborhoods unfashionable — and they have been turned over to that sad poverty-bitten element of society known as The Poor, who live in some sort of hand-to-mouth fashion in the crumbling homes which once sheltered substantial citizens.

The Poor we may have always with us—but it is decidedly questionable whether these would not be more self-respecting, consequently more ambitious, and less of a reproach to society, if there were no opportunities offered them to congregate in houses whose condition emphasizes their own misery.

Is a Civic Improvement

It is undeniable that the making over of old houses into clean, comfortable dwellings is a possible and a promising public improvement. Building is still far in arrears of demands the country over. Consequently the revamping of old houses so as to meet a part of the constant demand for decent habitations should make a strong appeal to builders possessing public spirit.

In this process of making new homes from old ones New York City has long ago shown the way. Thousands of old "brownstone fronts," each soaked with traditions and memories, are being made over yearly into clean, trim, comfortable apartments of one, two, or three rooms with baths and kitchenettes. As fast as carpenters and painters and electricians can function, parquet floors where once belles and beaus stepped daintily to the strains of the Blue Danube Waltz are finding their still substantial surfaces broken and divided by partitions which may cut a ballroom of noble proportions into a cozy suite—living room, bedroom, and vestibule. Closets where once hung lacy petticoats and sealskin sacques have become tiny tiled baths; butlers' pantries, their shelves and sinks perhaps still intact, are convenient little kitchenettes.



The pleasure comes in achieving large results in possible comfort and happiness for many families through minimum expenditures of money and labor. Especially in cities is this true, where concentrated humanity makes housing one of the biggest problems of progress.

Reclaiming the desert, making it bloom and blossom as the rose, turning sterility into fruitful loveliness, is one of the proud accomplishments of the twentieth century.

Reclaiming those shabby down-at-heels sections that seem to be an integral part of every city, making them over into clean, shining avenues of homes, with faces newly washed and pinafores and underthings freshly starched, would seem to be an accomplishment equally valuable to humanity.

While other cities may not be so crowded as to necessitate making one old home into six or eight apartments as is being done in New York's cross streets from Washington Square northward to Central Park, yet it is true that the fashion of the day is for smaller dwellings than those which flourished when the substan-

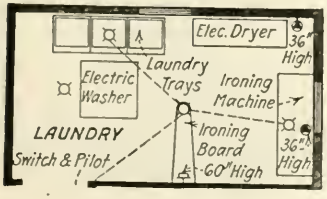
tial old houses which are candidates for rebuilding were erected. These are now in many instances being divided into two-family houses or apartments, and the comforts and conveniences made possible to them by the ingenuity of architects of today may be added to turn them into homes nearly, if not quite, as attractive as those being built outright.

Wiring Is Most Important

Most important among the changes made to bring old homes up to new standards is the system of electric wiring which will be installed. Striking differences between housekeeping of today and that of yesterday has grown out of the evolution of electricity. Housekeeping is not alone in this — business, commerce, and industry have been "sped up" by the same magical power. But builders are slow in sensing the change as regards housekeeping; they have failed to keep up with progress in this, a most important development in homebuilding; they are prone to relegate wiring and electrical fixturing to an obscure place in the budget of building costs, instead of putting it where it belongs among the essentials.

Yet if homes are to be up to date there must be wiring installations which will provide ample current and ample connections for the fast-increasing tribe of electric servants which women are using and demanding.

That builder who is first to get the habit of incorporating a generous electrical installation in his other plans will certainly reap pleasing returns in the popularity of the homes he builds or remodels. This fact has had ample proof in the sales of homes throughout the country which have been fitted up with elaborate electrical installations as showplaces. Without exception, it has been demonstrated that sales have been quick on these homes; and that prices because of the electric equipment were considerably in advance of the differences in cost incurred by the inclusion of that equipment.

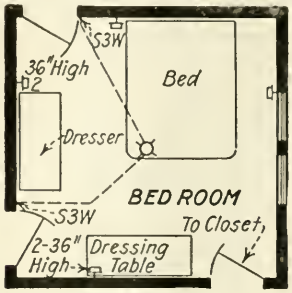


In the accompanying illustrations are embodied suggestions for electrical installations which may be made a basis of plans to be used in remodeling homes and bringing them level with present-day requirements.

These diagrams designate the average number of outlets for electricity, lighting outlets or convenience outlets, switches, etc., required in each room of a home. They must be read flexibly, and their designs adapted to the size and the floor and wall plans of the home being remodeled; but they should not be cut down if a truly modern wiring plan is wanted.

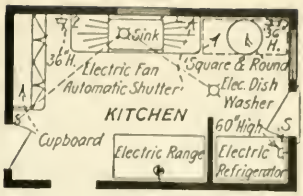
Rooms in Detail

The living room plans provide for plentiful illumination. There is a ceiling fixture, also wall brackets; in addition to this the prevailing popularity of portable lamps is recognized



in the numerous convenience outlets where these may be attached for providing light in individualized areas. These outlets will also be wanted for fan, talking machine, electric cleaner portable heater, electrified teawagon, and many other appliances. There can scarcely be too many; it must be remembered that furniture is occasionally moved and rearranged, and that abundant convenience outlets make this easy.

The dining room plans call for an adequate table lighting fixture. Considerable discussion has taken place of late concerning the type of lighting suitable for this purpose. While the old-time dome was, if planned and hung just right, satisfactory in that it lighted the table brilliantly and left the rest of the room in shadow there were so many times it was anything but just right in this placing that it grew to be regarded with suspicion. Lights frequently were so



low diners were annoyed by glare in their eyes. Or the dome interfered with vision across the table. In many instances the dome was a clumsy ugly affair, taking up so much room that it was an eyesore when the table was under it and a nuisance when the table was removed.

Yet the theory of directing light on the table is a pleasing one. Today there are made many efficient fixtures which will accomplish this hemming in of those at the table without the objections of the old-time dome.

In the dining room, as elsewhere plentiful convenience outlets should be installed to care for the table appliances, and the other labor-saving electrical equipment which will be used there. Especially obnoxious is the practice of hooking electrical table cooking appliances to lamp sockets. Convenience outlets, adequately wired, preferably on a separate circuit from that devoted to lighting, make appliances decidedly more practical and convenient than when they are unprovided with these connections.

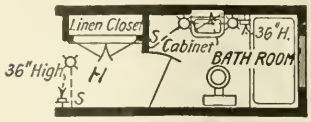
This plan of placing power and heating equipment on a separate circuit from lighting is promising to be popular, and is certainly efficient Wiring in this instance may be sufficiently heavy on the power circuit to permit the use of all the devices a woman's heart can desire without the chance of overloading the lighting circuit, with consequent annoyances.

Let's Have Abundant Light

Bedroom comfort will demand an equally generous allotment of outlets In addition to the places where heater, sweeper, heating pad, curling iron, or any of the other electrical comforts will call for connections there must be ample and plentiful lights in the bedrooms so that each mirror and each bed shall have its individual illumination. Other lights than this should be considered for sewing, or for general use. There may be a desk where a portable lamp is needed. Lights in closets, etc.

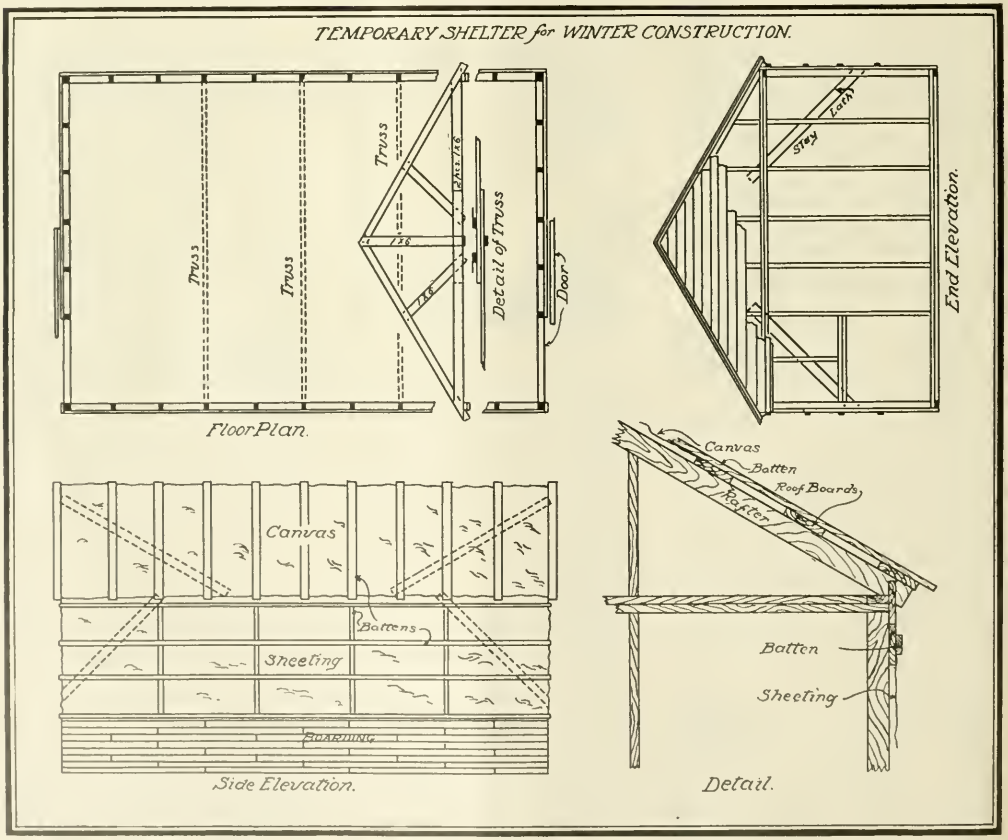
Good lighting in the woman's workroom is as essential as is good lighting in factory workrooms; yet it is frequently omitted in kitchens and laundries. There should be central lighting in the kitchen which really illuminates the room. Supplementary brackets should be added if necessary over stove, sink and kitchen cabinet. Convenience outlets should be provided for iron, fan, dishwasher motor, plate warmer, fireless cooker every labor-saving device which may be adopted to give kitchen ease. There should also be wiring for an electric range; though this be not installed at the time the house is first occupied, yet it is very likely to be purchased later, and wiring will then be more difficult. And don't forget oulet for an electric exhaust fan in the kitchen.

In the laundry lights must be as conscientiously chosen as in the kitchen. There should be an overhead fixture with a carefully devised shade so as to flood the room with brilliant, pure white light. This is



better for the searching vision required in laundering clothes than the yellower light popular in other parts of the home. Supplementary brackets may also be needed here. Convenience outlets for connecting washing machine, ironer, and iron and fan are requisite. For attaching the washing machine, an outlet high in the wall is preferable to one near the floor as this keeps the cord protected from dampness.

In the fall of the year, when there is a rush to get a job done, work can be carried on at night by having electric lights around on the job. For outside work large nitrogen lamps with reflectors are the thing. In the majority of cases, however, a great amount of work that is to be done during the winter is done under cover, and, of course, here electric light can be used to advantage. In fact, the entire twenty-four hours is really available working time. This is quite important when there is a rush to get a building completed. This temporary lighting is very easily accomplished; while portable lamps produce adequate illumination at any particular point of the work desired.



Type of Temporary Building Recommended to Protect Winter Work Described on Opposite Page

How to Protect Work and Workers During the Winter Season

By LAWRENCE S. KEIR

MORE than usual consideration is being given lately to the protection of work in cold weather. Perhaps a little more on the subject will do no harm. We still put off too many jobs until warm weather that could, with a little protection, be done in cold weather.

Naturally it costs something to protect a job from cold and storm, but often the extra cost is small, and our only real reason for not going on with the job is lack of gumption. I ought to know, I have been the same myself.

Frequently the owner is willing to pay extra to have his work pushed along. Perhaps the loss of rent or use of the building will cost more than the added cost of winter work. Lots depends on the character of the work. On some jobs it would hardly pay to go ahead in cold weather, while on other jobs the building may be urgently needed or perhaps the job is of such a character that considerable hours of labor will be required in a small space. Such jobs as waiting stations, auto service stations, comfort stations, new fronts, etc., are examples. Many small structures are easily protected by erecting temporary frame buildings to enclose the entire job.

Sure, it costs something. Perhaps a bigger price can be asked for doing the work in winter. Even if not, small protecting buildings do not take long to erect and the materials used can be made use of again on some later job. Some small jobs have considerable labor attached to them, what with excavating, foundations, plumbing and the building proper, and a "half loaf is better than none" any time. There is also an advantage when spring comes if you and your cash are free for new jobs. Also you have added a little of your reputation, and that is worth something.

YOU may even take advantage of chances for some good advertising by use of a proper sign on the premises, giving the builder's name and address and calling attention to the fact that Jack Frost can't phase you. Where small jobs are entirely closed in houses of the general type shown by the drawings are usually used. The lower four or five feet of the structure and also the gable ends are boarded solid. This gives stiffness and adds protection.

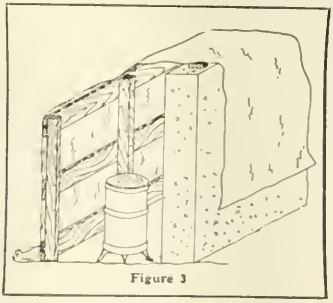


Figure 3

The studs and rafters are usually four feet on centers and braced by nailing stay lath to the inside of the framing.

The upper portion of the side walls is closed in with unbleached muslin. This is a cheap material and furnishes both cold and storm protection and light. The roof is covered with canvas or roofing paper. If canvas is used it may be made up in several sections of convenient size to handle, and if well taken care of it can be used for many other purposes from time to time.

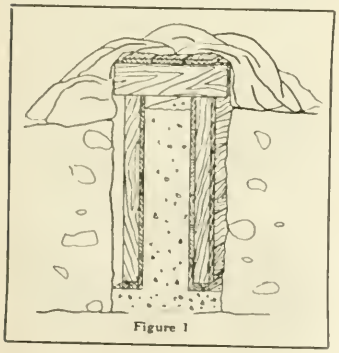


Figure 1

These buildings are generally heated with open salamanders, and it is well to provide some sort of shutter or door in the gable ends of the building to provide ventilation. Often it happens that it would hardly pay to go on with a building during severe weather, but it would be a big advantage to have the foundations all ready the first thing in the spring and not be obliged to wait until frost goes out of the ground to get started.

If trenches are dug wide enough so that forms can be carried down to the bottom, the forms can be filled with concrete and then covered with tar paper, canvas or litter. Warm concrete when protected in this way is not harmed by cold (Fig. 1).

CANVAS hung over the sides of the forms or paper lining on outside of them adds considerably to the protection of the concrete (Fig. 2).

Forms may be lined both inside and outside. This gives slightly more protection from frost and prevents the forms sticking or freezing to the concrete. Where one side of a wall is against a bank and the other side exposed a canvas can be hung over the wall, and at some convenient point held away from the wall, by use of some sort of frame work, far enough to allow a salamander or even one or more oil stoves to be placed beneath it safely (Fig. 3).

Another way is to hold the canvas away from the wall a few inches by

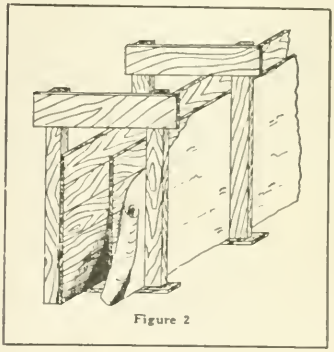


Figure 2

using brackets, the same brackets supporting a steam pipe as shown in Fig. 4.

Where a foundation wall runs only two or three feet above ground, a simple wind break on the north side of the wall will make it possible to take advantage of many sunny days that would otherwise be lost. Even when using warm concrete in protected forms it is sometimes desirable to erect wind breaks to protect the workmen. A couple of portable windbreaks covered with canvas or boards or roofing paper are sometimes handy to have (Fig. 5).

A few slats tacked across the scaffold poles and a canvas hung over them is a worth-while protection to a man engaged on some tedious exposed work (Fig. 6).

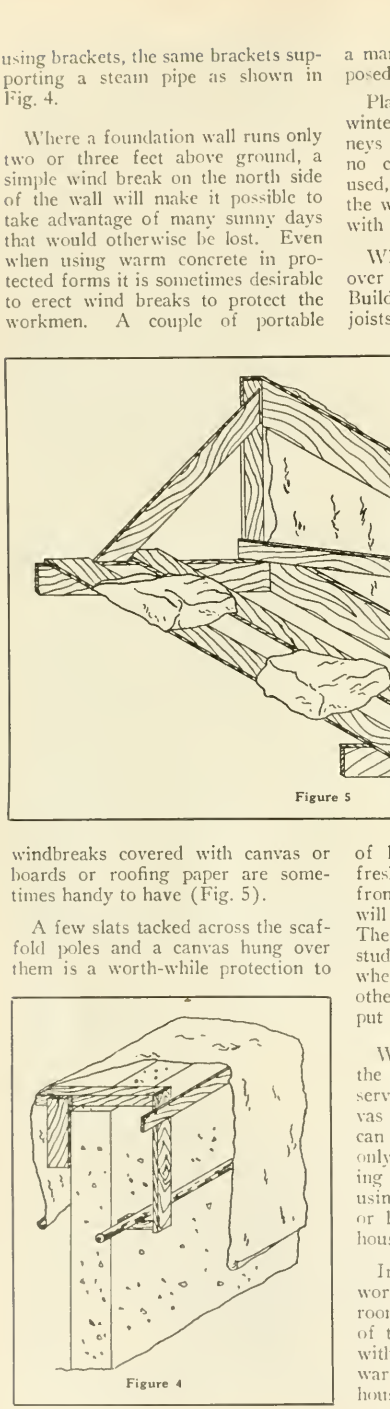


Figure 4

Plastering can usually be done in winter, especially if there are chimneys in the house. Where there are no chimneys, salamanders can be used, and if the sash are not in place the window openings can be covered with muslin.

Where attic floors are not boarded over tight a lot of warmth escapes. Building paper laid between the attic joists will help to prevent the escape of heat and also help protect the fresh plaster on the bedroom ceilings from frost. Paper laid in loosely will not interfere with plastering. The same idea can be used inside the studs on sections of outside wall where for some reason the siding or other outside covering has not been put on (Fig. 7).

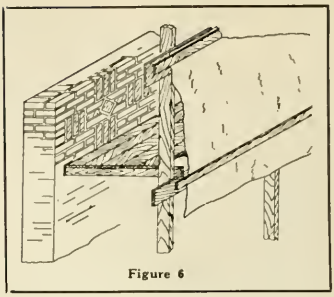


Figure 6

Figure 5

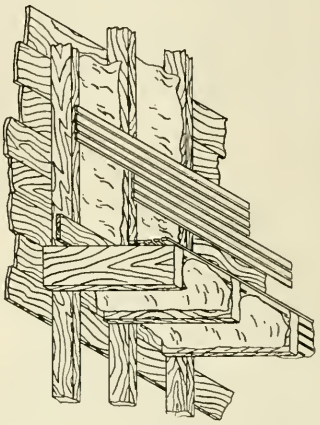


Figure 7

Where the stair well extends to the attic, a lot of heat will be conserved by covering the well with canvas or other covering. If the house can be best kept warm by heating only one portion at a time, the building can be divided into sections by using canvas or paper over the studs or lath and the heated part of the house plastered first, etc.

In some houses considerable bench work is done on the premises. A room, preferably on the sunny side of the house, can be partitioned off with canvas and heated comfortably warm even before other parts of the house are closed in.

There are endless jobs that can be done in winter by a little added planning and protection. Only a few suggestions have been made.

Unbleached muslin or sheeting may be had in the following widths: 36″, 54″, 72″, 81″, 90″. Canvas covers are usually made to order and can be had in several weights and any shape or size desired, and in either white or khaki. It pays to buy good ones.

In the words of H. Colin Campbell, of the Portland Cement Association, "Let's Keep Building Going All Winter." There is no excuse for anything less than a twelve-months' construction season — except the excuse of bad habit. There is no reason why the winter months should not take some of the burden of keeping things going. It can be done and is being done every year by builders and contractors who know the profit of keeping their efficient organizations together and working. Let's all do it!



PAINTING

Practical Points of Interest to the Builder

Painting *in* Winter-Time: *and Its* Difficulties

By A. ASHMUN KELLY

WHICH is the best season of our year for doing exterior painting? This question has been discussed for many years, and still without having been decided one way or the other. This because each season has its advantages and disadvantages for this kind of work. The Spring has its showers, catching wet paint and hindering the work. Summer has dust and flies, which spoil the paint. Autumn comes nearest to scoring perfect. Winter has its frost, snow and freezing, all bad for painting, though I cannot say positively bad for paint.

Some wise man has said that the best time for outside painting is when you are ready to have it done. And that is not very far from the truth.

Now, as to winter painting. Winter is at or around the corner as I write. There will be plenty of painting to do, inside and out. So I will discuss this matter of winter painting here.

There are two main difficulties that we painters have to meet with when doing outside work in cold weather. The oil becomes stiff, making it difficult to spread, and taking more time than in warm weather. Also the paint does not get rubbed out enough.

It is very important that a coat of exterior paint be brushed out thin and even; if too heavy a coat, or uneven in its brushing out, it is liable to crack or peel in the future. The only way to do, is to warm the paint once in a while, to keep it in a working condition, and this takes time, too. But it will pay in the time saved in its application and in the better coating it will give.

BY having the paint mixed in quantity in a warm place, one can run in and get a fresh pot of paint whenever the paint we are using becomes too stiff. Some painters make the mistake of thinning the paint, sometimes with oil, sometimes with a little turpentine. This is a mistake, as it makes the paint thinner than it should be.

Turpentine is often added to the paint in mixing for cold weather, for that makes it easier to spread, but for a last coat I never want turpentine added. A little might do in previous coats. It tends to harden the paint a little, and also assists the drying.

I have mentioned the difficulty of spreading oil paint in cold weather. In addition to that there is the discomfort of working in cold weather, for the painter does not have the exercise that other mechanics have in working, hence feels the cold more. The situation may be greatly improved for him by working in the least exposed parts, as on the sunny side when the sun happens to be in evidence.

That used to be my practice, though most employers insist on taking the building right around regardless of weather conditions.

Now as to the character of painting done in cold weather. Is it as durable, and will it make as nice a job? Yes, quite as durable provided the paint has been properly rubbed out, as I have already pointed out. There are two important points here to be taken into consideration, namely, the character of the wood that is to be painted; is it as dry as it would be in warm weather? Usually it is not, and therefore the paint does not do as well as in dry, warm weather.

ON the other hand, the sun bites the life of paint, which is the oil, so that it may not be as durable as winter-applied paint. Also, if the paint that has been applied in the winter afternoon is fanned by a raw, damp breeze at night it is sure to affect the fresh or undry paint and give its surface a rubber-looking appearance, which, while no harm is done to the integrity of the paint, spoils the finish. When such a case occurs all you can do is to either remove it, or rub it well with raw linseed oil, which may restore its luster. To prevent is, in this case, the best policy. Try to avoid painting that part in late afternoon that may be exposed to a possible damp night air.

I have painted in winter on the north side of a house, when the breeze was in that quarter, and the cold so intense that I have had to run to shelter every little while, to knock my frozen fingers to get the blood to going in them.



CARPENTRY

Good Practice in Frame Construction and Finish

Profitable Work *for* Winter Time

Little Things That Can Be Made and Sold When Big Jobs Are Few

By DALE R. VAN HORN

ONE can often find good money in an almost virgin field during the slack months of the contractor-builder's season. In other words, when no large jobs appear on the horizon and the wallet grows thin, go out and create a market for some useful thing, and then push it. It will provide enough to live on, if nothing else.

When the contractor or carpenter has finished the house he usually thinks that his presence there is no longer needed and sets out for new ventures. When work is scarce it behooves the man with an eye to his income to seek additional work about the place which will bring in money.

Beautifying the Home Surroundings

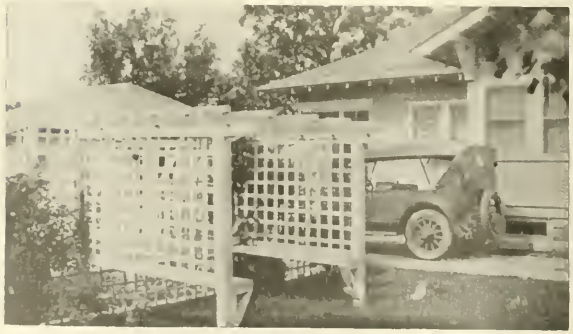
Almost every new building site presents a good field for such effort, if the financial status of the owner is such as to warrant it. In the photo is shown a corner of a western home site. The bungalow, recently erected, shows in one corner. This lot upon which the house has been built was low and below the roadway. For this reason the owner was able to buy it cheap. After it was graded up to the proper level its value was almost doubled.

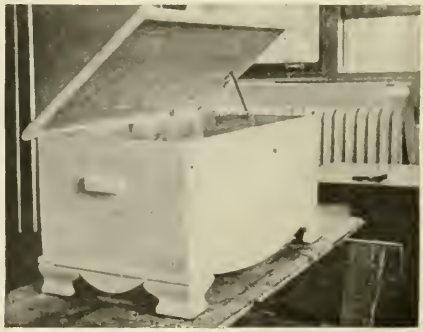
But at the back of the lot there was an abrupt drop of several feet to the old level. The builder, noting this, brought the matter to the attention of the owner, who, after hearing a suggestion or two, turned over the matter to the contractor with the result shown.

The attractive lattice fence of one inch white pine strips runs the full length of the lot, and on the front side a few feet from the drive to the garage the pergola was built. Though the material costs practically nothing, the contractor was able to realize handsomely on the job because the work required was nominal compared to the result thus obtained, which was what the owner wanted.

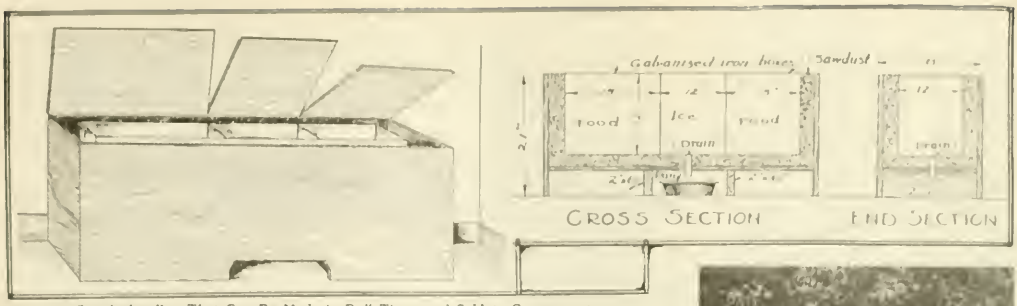
Cedar Chests to Conform to Room Colors

One seldom sees a cedar chest finished in anything but the natural colors, yet often a chest of this wood is built of such a light or inferior material that the effect is anything but pleasing. A chest built of the red cedar should be made from pieces carefully selected to give the variegated finish found on the best pieces of work. When this is not possible and only second quality lumber available the chest can be made to fit in with the color scheme in any room by giving it the proper treatment and the desired finish.





Making Lattice Fences, Pergolas, Summer Houses, Cedar Chests, etc., are Profitable Lines of Winter Work



Simple Ice Box That Can Be Made in Dull Times and Sold to Campers, etc.

Also, where the chest is wanted of cedar only for its peculiar properties, namely, to keep away insects and pests, considerable of the purchase price may be saved by a chest made of the cheaper wood and then painting it the proper color.

The cedar chest shown in the accompanying cut has been finished a soft cream color to harmonize with the color of the woodwork in the room for which it was intended. It was first given two coats of shellac to keep the rosins and oils in. After this had dried thoroughly a coat of the flat color was applied. Two days later the first coat of the interior cream finish was put on, and ten hours later, the second coat.

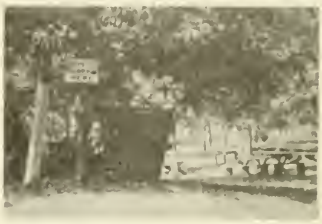
Combined Kitchen Seat and Refrigerator

Briefly, the ice box, which is shown in the accompanying drawings, consists of a wood box made in the shape of an ordinary window seat. Within are three compartments, the center one containing the ice, and the two on the outside being used for food and other things in need of ice. The wood box forms the outer wall, then comes two inches of sawdust, with a galvanized iron box partitioned off into the three spaces mentioned above. The front side is cut away as shown in figure one for the drip pan, and the hinged top which extends over the edge on three sides one inch is cut into three sections, so that one compartment may be opened without disturbing the others. Cleats which may be nailed on the under sides of the doors will prevent them from splitting and will further add to the strength of the box.

The outside dimensions of the box are: Height, twenty-one inches; length, four feet; width, eighteen inches.

The outer walls should be made first. The floor is supported above the floor of the kitchen by 2"x6" pieces running from front to back. Upon these are laid matched lumber for the floor. Suitable hardwood to take an interior finish should be used for the outside.

Measurements for the iron box may be taken to the hardware store and there made. See that all joints are tight and a short length of pipe fitted into the center of the floor of the ice compartment to drain away the water.



Waste Receptacles Sell Readily and Are Easily Made in the Shop

This is then set into the box, after the bottom has been covered with two inches of sawdust well packed, and then the sides filled. When full, strips of linoleum should be tacked over the top of the sawdust filling to prevent occasional working out.

The metal partitions between the ice and the two adjacent compartments readily permit the passing of the cold and save space. Moreover, it makes a tight inner lining and keeps the sawdust dry.

By altering the size and construction of the box it can be made to suit





Portable Hog Houses Are Easily Made in the Shop During Winter Time and Sell Quickly in Farming Sections

a number of individual conditions. The drip pan may be done away with by attaching a short length of hose to the end of the drain pipe and running it to some convenient place outside. And if a hole is cut through the side of the house to open into the ice compartment, filling may proceed without having the kitchen floor tracked.

This box can be used in the spring and fall as a simple cooler, by leaving this door from the outside open, if it has been provided. The outside air will circulate freely within, keeping the whole box at an even, low temperature.

Waste Receptacles Are Easily Made from Waste Lumber

One Sunday while spending the afternoon in a city park a carpenter noted that the campers and picnickers were often forced to carry their waste paper and empty pie plates a long distance to throw them in the discard. They did it, of course, most of them, but the receptacles should have been more frequent and not so far apart.

The next day he sought an interview with the park commissioner. He argued the wisdom in providing these containers at frequent intervals over the parking area, and in less than thirty minutes he had an order for twenty-four such as are shown in the photo. These sold at a nominal figure, and yet represented a neat profit, for they were all made from scrap lumber.

While he was at it, the carpenter built a dozen more and disposed of them readily. The investment was labor alone, and he realized on an otherwise waste product.

Individual Hog House Proves Good Sideline

The cut shows a small individual or colony hog house of the portable type. It has been designed by the University of Nebraska and is proving good success on the farm. An idea of the way it is proving up in the field can also be otbained by the large number of orders which come in from out in the state for blueprints of the house.

During the winter season when work slackens up some such sideline will come in handy. Being portable the houses can be built in the shop and then sold when completed. Being portable and easily handled the farmer will not mind the idea of hauling it home.

This house is six feet wide and eight feet long. The runners are four by sixes, which are bolted to the frame. The floor is of plank on stringers, and a plank pig rail about the four sides protects the young pigs.

One unique feature of this house is the large number of doors. There are two doors in each side of the roof, and each side is also hinged to swing up. The entrance is two feet wide and three feet four inches high, which is large enough for the biggest brood sow, with a rare exception.

Ventilators, one at each end, insure a maximum amount of fresh air when the building is closed. A farmer who raises hogs could readily afford the small amount asked for one or more of these.

Some Points on the Use of Metal Lath

THE use of metal lath as a plastering base for suspended and vaulted ceiling is resulting in an ever increasing use of this form of construction. It is being quite extensively used for decorative purposes in the better class of residences, theatres, schools, institutions, public and office buildings, etc.

Its economy and ease of erection compared with other methods of obtaining equal effects has resulted in greatly extending its use throughout the country. In places where this material is not used to any great extent, it has been probably due to a lack of realization of the advantages of its use by local lathers and plaster contractors who sometimes fight shy of a suspended ceiling job that is out of the ordinary.

After much research in connection with the common practice in different localities throughout the United States a form of specification has been approved by the Associated Metal Lath Manufacturers for the safe erection of suspended ceilings.

In a great many cases, suspended ceilings were erected in a manner that violated some rules of good construction and several failures have occurred. Now, this was not due to any fault of the metal lath or hanging equipment, but rather to faulty knowledge of the proper way of erecting the work. Following are specifications that if followed will result in a good job:

HANGER—The vertical member which carries the steel framework.

The minimum size for hangers shall be No. 8 galvanized wire 1 3/16 in. flats or 7/32-in. round mild steel rods. The wire is to be attached by twisting three times, —flats attached by bolting with ⅜-in. bolts,—rods by twisting twice, or by right angle bends and wiring. They shall be spaced not to exceed 4-ft. centers in either direction.

RUNNER CHANNEL—The heaviest horizontal member.

Runner channels are to be not less than 1½-in. channels with a minimum of .442 lbs. per lineal foot. They shall be spaced not to exceed 4-ft. on centers.

FURRING CHANNEL—The smallest horizontal member, to which the lath is attached.

Furring channels shall be not less than ¾-in. channels with a minimum weight of .276 lbs. per lineal foot, attached to runner channels by at least three loops of No. 16 galvanized wire at each crossing. They shall be set on various centers, depending upon the lath to be used. A maximum of 11¾-in. centers shall be used for 3 lb. flat lath, 15¾-in. centers maximum for 3.4 lb. flat lath, 19-in. centers maximum for 3 lb. Rib Lath.

METAL LATH — The plastering base and reinforcement.

Metal Lath shall weigh not less than 3 lbs. per square yard. Metal Lath shall be attached to the furring channels by No. 18 gauge annealed galvanized lather's wire, every 6-in. along the furring channels.

USEFUL CATALOGS



Portable Woodworker

WELL illustrated is the large folder describing the Master Woodworker, a copy of which will be sent to any of our readers by writing to the Woodworker Mfg. Co., Inc., 612 Brush Street, Detroit, Mich. Such a machine on the job will prove a well paying investment in the time it saves, to say nothing about the grade of work done.

Better Piping for Homes

WATER service piping is subject to a good deal of deteriorating influences, and brass pipe successfully withstands these. An interesting book on brass pipe and piping is issued by the Bridgeport Brass Company, Bridgeport, Conn. It deals with corrosion, laying out installations and figuring cost. It will be exceedingly valuable to the builder who really wants to put out a good job. The catalog will be sent to any interested reader.

Keeping Out the Cold

FOR overhanging sections of rooms, that project as bays or built over an open porch, there is considerable difficulty in keeping that portion of the room warm in the winter time unless some good insulating material is used. A sample of sheathing quilt for this purpose together with descriptive catalog may be obtained by the makers, Samuel Cabot, Inc., 141 Milk Street, Boston, Mass. This material when properly used certainly is an excellent insulator against the cold. It is made of eel grass, does not burn and is low in cost.

Casement Windows

THE attractiveness of many homes can be enhanced by having several casement windows. Even in houses that are already built when a room is to be remodelled, casement windows can be substituted with an artistic result. Builders would do well to keep themselves posted regarding what can be done and for this purpose the catalog of Henry Hope & Sons 103 Park Avenue, New York City, will be of considerable interest and value.

ON this page we give short descriptions of some very interesting catalogs, etc., that have just been issued by different manufacturers.

They will be sent free on application to any of our readers who are interested, but should you prefer to write us, give the date of this issue and title of the catalog desired, and we will have them sent to you.

Electrical Equipment

BUILDERS are keen about installing proper electrical wiring with adequate convenience outlets so that different forms of electrical equipment can be easily installed. This is always an attractive point in selling the house, as people now-a-days look for and demand these convenient things. To select proper switches and outlets will be easier if one has the catalog of the General Electric Company which may be obtained by builders, by writing them at Bridgeport, Conn.

Spring Hinges

DOUBLE swinging doors are being used in practically every modern home for some particular place. They have many decided advantages but to take the proper advantage of their convenience, one must have the proper hardware. Builders will be interested in the forty-four page catalog describing spring hinges made by the Chicago Spring Butt Company, 1500 Carroll Avenue, Chicago, Ill. A copy of this catalog, No. 39, will be sent to any of our readers.

Surveying for Builders

BUILDERS on every job have use for a transit and level, therefore, they will be interested in the description of the Sterling transit and levels as described in the new catalog just issued by Warren-Knight Company, 136 N. 12th St., Philadelphia, Pa. This interesting book of thirty-six pages will be sent to any of our interested readers.

Plumbing Supplies

A FALL building bulletin has just been issued by the Hardin-Lavin Company, 4533-39 Cottage Grove Avenue, Chicago, Ill., which contains descriptions of several different styles of plumbing equipment for modern cost homes and it is well worth sending for as it contains a number of new ideas.

Copper Roofs

EXCEEDINGLY interesting is the 22-page booklet on the use of copper for roofs that has just been issued by the Copper and Brass Research Association, 25 Broadway, New York City.

Some very valuable information is given, amongst which, we may mention, is a handy table on the weights of different roof materials. This booklet is worth while having by anyone interested in the subject of proper roofing.

Porch Columns

WE all know that porch columns when set directly on porch or terrace floors have a tendency to rot due to moisture at the bottoms. To prevent this decay, iron bases are often employed and an interesting catalog describing the Zimmerman patent iron base has just been issued by S. Cheney & Sons, Manlius, N. Y. It describes their bases which are carried in stock sizes to fit 4 to 16 inch diameter columns.

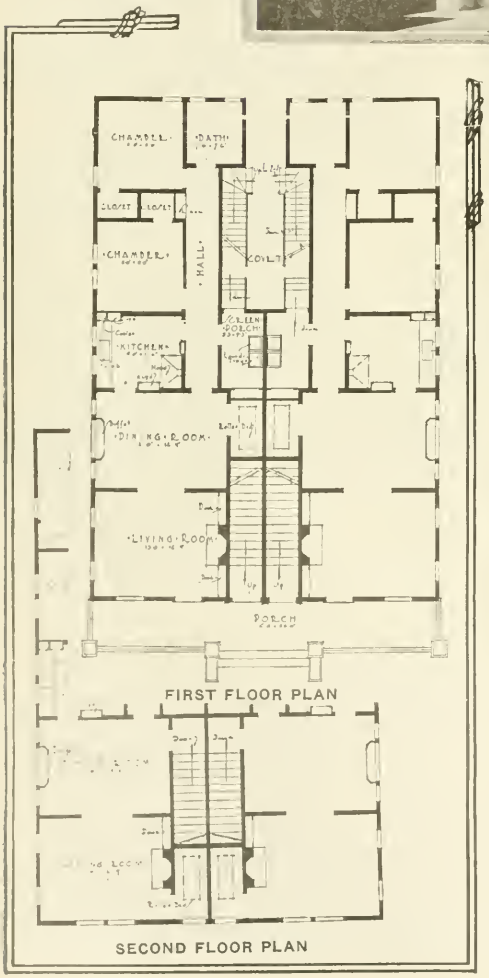
House Moving

FROM LaPlant-Choate Mfg. Co., Cedar Rapids, Iowa, comes a very interesting catalog of thirty-four pages devoted to the special trucks, rollers, jacks, capstans, etc., for the moving of houses. With such equipment on hand a builder will find the moving of a building far simpler than when old fashioned methods are employed. Besides containing the description of the different equipment the catalog contains a number of illustrations and descriptions of different house moving jobs and it certainly will make most interesting reading matter for any builder.

Four-Family House

Each Apartment Has Separate Outside Entry





HERE is a design for a four-family apartment which consists practically of four separate homes as each apartment has its own separate outside entrance. The construction of this apartment building is of frame covered with stucco, but it could be of hollow tile or brick, if preferred.

The room arrangement has been well planned and each kitchen has a sink with drainboard on each side with cupboard below; this occupying the entire side of the kitchen and gives a good working space under the double mullion window. The gas range is located on the opposite side of the kitchen. The laundry tubs are located on the rear entrance porch which is a more convenient place than having them either in the cellar or in the kitchen. There is also sufficient space on this porch for washing machine, ironing board, etc., besides a refrigerator. This attractive apartment was recently erected in Los Angeles, California, by the De Luxe Building Company of that city.

In this day of handsome, modern, comfortable apartments and dwelling houses it is interesting to reflect that the earliest human dwellings were probably natural shelter places such as caves, overhanging rocks and densely interwoven foliage. But a form of human architecture had been developed by the time the progress of man reached the Neolithic period and these most primitive dwellings had much in common with the homes of burrowing animals, says a writer in S. W. Straus & Co.'s Investors' Magazine.

The primitive man went into the earth and sought warmth and protection from the elements in pit dwellings, but the habit of living in pits must have been developed after the disappearance of those huge animals which in earlier times would have broken through the roof of such a place.

It does not require much reflection to discover how things have improved since those ancient days. Today, if he can afford it, the master has a comfortable six-room apartment and can seclude himself for weeks from his servants if he is lucky enough to keep them for that length of time.

What the Editor Thinks

Winter Building

NOVEMBER in our Northern States will bring to completion many building projects, and there will be but comparatively few new jobs started until next Spring, but this is no reason why builders should let up and not do any work. There are many things that can be done to keep one profitably occupied during the next few months even though the winter should be very cold.

In several articles in this issue different suggestions are made on how construction work can be carried out during cold weather—profitable side lines, and other work that will tend to eliminate this seasonal difficulty in the building industry.

Elimination of the Cellar

MANY changes are occurring in the building of homes. The tendency of late years has been the making of smaller and more compact homes, so that work will be reduced to a minimum. In the old days when "servants" were plentiful at small wages, large houses were the rule. Today when "maids" are an expensive luxury, house work duties are cut to a minimum. This has brought into being the kitchenettes and diningettes, door beds, etc.

Another step in eliminating work will be the omission of the cellar. The constant going up and down stairs takes time. Nowadays heating plants, etc., can be arranged on the floor level. Another point that is of considerable importance is the saving in expense of excavation and foundation work. To take the place of cellar a storage room can be added to the floor plan.

How Long Can Workers Labor Efficiently?

LABOR efficiency is higher with three shifts of eight hours each than with two shifts of twelve hours each. This was indicated in a careful survey and report made by a committee of the American Engineering Council.

Continuous operations, according to the committee, were found to constitute a great industrial problem about which almost nothing is known either by labor, the employee or the public. In the building industry, continuous labor is but seldom resorted to, but in the case of large buildings work is frequently carried on day and night, artificial illumination being provided.

It is a curious fact that a great percentage of the accidents occur on Monday or the day following a holiday. The day of rest seems to make men a trifle less careful.

Our Cover Design

BRICK work lends itself to make the very interesting home shown on our front cover. This was designed by S. Edson Gage, architect, and was built at Rye, New York, for Mr. E. Brophy. In the chill days of November, there is something very comfortable looking about a house of this sort with its glass enclosed living porch.

Quantity Surveys

RATHER interesting was the experiment of the Master Carpenter Association of Milwaukee, in clubbing together to hire special estimators to take off a quantity survey from plans submitted by architects to different members of their organization. Sometimes as many as ten members were asked to figure on the carpentry work of some particular building and this would mean that each would have to figure out the quantity separately.

The subject of the quantity survey is an interesting one. Why should builders make this up? It is really part of the architect's work as well as plans and specifications. We may as well expect the builder to furnish plans, specifications and everything, and, of course, that is frequently done on most small jobs ,but for larger operations a quantity survey should be an essential part of the data given the builder when asking for his bid.

The fault, however, is largely due to the owner. He wants to get plans and specifications as cheaply as possible and should an architect suggest to have a quantity survey, in most cases he will be over-ruled on account of expense. Little does he think that the builder must, in all fairness to himself, charge in his time for taking off this quantity survey and not only that, but he must also charge in his time spent for making estimates on jobs that he does not get.

The owner actually pays for all this, and if he was required to give a quantity survey with plans and specifications, the architect would be more than willing to give it as part of his service. It would result in an actual saving to the owner, better satisfaction to the architect and a better and more definite bid from the contractor, as he would not have to add a safe percentage for items that *may* be called for.

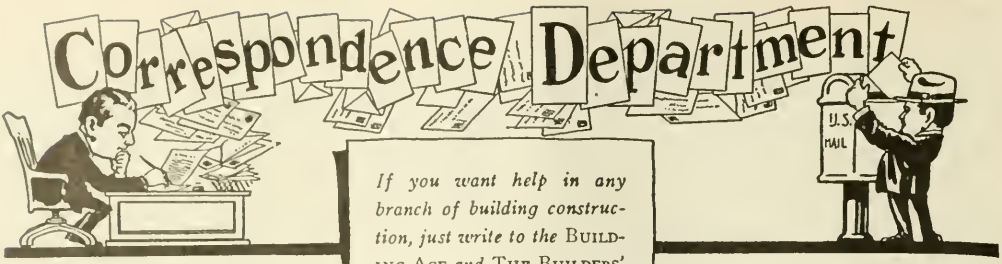
The construction industry as a whole should try to educate the public to know what constitutes the proper preliminaries for a building. In very few other occupations or industries is anyone asked to do a whole lot of hard work for nothing. Why should it be in the building industry?

Give the Boy a Chance

WATCH the boy that hangs around a building operation. Give him an encouraging word once in a while instead of chasing him away. He is usually a bright youngster that looks with awe on the workmen doing their appointed tasks. He is interested in building. A word or two of encouragement will instill in him a desire to join the building craft when his school days are over.

If this kindly interest had been taken universally in this country, we perhaps would not be feeling the present lack of skilled labor to such an extent. The boy is the hope of the building industry.

It is absolutely nonsensical for Americans to deplore the fact that skilled mechanics are not coming from Europe. We have the best material here—give the boy a chance.



If you want help in any branch of building construction, just write to the BUILDING AGE *and* THE BUILDERS' JOURNAL *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Roadside Markets

SEEING an article in a recent issue of BUILDING AGE and THE BUILDERS' JOURNAL about the desirability of building roadside markets, I think it will be of interest to your readers to see a picture of one.

At Avondale, Penna., on Route 131, Charles H. Sweigart, a man who has made a success of farming and chicken raising, has built for himself a farm products booth along the highway, in which he sells the things that are raised on his farm. This building is all his own idea, and while not pretentious to any great extent, still, is very well executed and answers the purpose most admirably, being both near and serviceable.

The roof is of asphalt shingles and the building is well planned and put together. It is not an eyesore and the neat signs help to carry out the idea of a service station for the selling of farm produce.

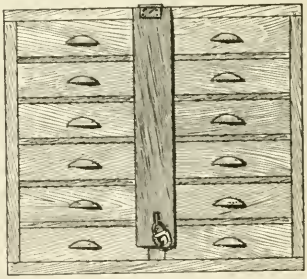
This little building was erected for a modest sum and as you suggested in your editorial similar structures could be used along many roadways by other people with changes to suit, obtaining perhaps a more artistic design, but this venture is a pioneer one and is certainly a step in the right direction.—**C. H. Thomas.**

Locking Several Drawers With One Padlock

OUT in the middle west a farmer employed three tractors and several men throughout the summer months. To keep the tractors and other machines in repair he fitted up a small shop and laid in a supply of plenty of tools. At first the tools were kept in a drawer in the bench. He found, however, that these tools, small wrenches, a hammer now and then, and chisels and punches were frequently used and not replaced. In time, a hasty inventory disclosed the fact that some eight dollars' worth of tools were missing. Not that the men were suspected, yet he knew that they were the ones who failed to replace the articles.

A set of drawers were built between two studding, each large enough to take the small things which are the most easily lost about the place, and then instead of leaving them without a lock of any kind, or providing every one with a separate lock, he hinged a strip at the top, cut a hole near the lower end, and drove a hasp staple into the center strip between the two rows of drawers so that the hole in the wood strip would fit over the staple. In this way one padlock kept all of the drawers locked.

The plan seemed to work very well, a point was made with the hired help to do most of the repair work, and it was always necessary to get the key



before the contents of any of the drawers could be touched. Later a list of the articles to be kept in each drawer was pasted on the front of each.—**Dale R. Van Horn.**



Successful Rust Remover

THE most thoroughly rust-covered metal may be restored to its original bright color and condition by rubbing with a red eraser, or—better yet, a sand eraser. A too coarse sand eraser should not be used if scratching the metal's surface is to be avoided. This method of removing rust is effective on any metal and will restore rust-covered carpenter's and builder's tools and draftsmen's instruments, to their original appearance. To those trying it for the first time, the result is surprisingly satisfactory. —**C. Nye.**

What One Builder Did With Cobblestones

THE attractive bungalow shown here is thirty-four feet by sixty feet. It was designed by Mr. Durbin Swartzell, of Cincinnati, as a suburban home at Brookville, Indiana.

The house has a wide veranda along both its front and side. Two doors open from each of these porches. The one gives access to parlor and sitting-room,, the other dining-room and kitchen.

The house has been built, as far as possible, of cobblestones brought from the bed of Whitewater River nearby. —**Felix J. Koch.**



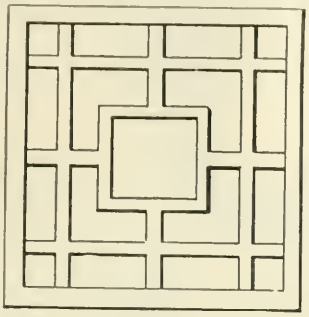


Figure 1

Ornamental Lattice Easily Produced

IN building fences where certain portions are to have ornamental pieces of lattice work, it sometimes puzzles the carpenter how to get the desired effects shown, except at an immense amount of labor.



Figure 2



Figure 3

I follow quite an easy method. For instance, the design shown in Fig. 1 does look a little bit complicated, but it can be very easily finished. I simply nail my lattice strips in the frame as shown in Fig. 2. This is just plain cross pieces. At every junction point, I put in a small nail and clinch it. Of course where a large quantity of this work is being done and especially when it is being erected in position, it is necessary to have a helper on the other side to help in this clinching. Sometimes there are thousands of these clinches to be made. In all cases it is not necessary to nail every crossing, but every other one will give the required amount of rigidity.

When the different crossings are firmly fastened together by this clinching process, then proceed to cut away with a small saw the different pieces marked XX as shown in Fig. 3. When these cut portions fall away, the result will be the ornamental design shown in Fig. 1.—**Albert Fair.**

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Address The Editor, BUILDING AGE and BUILDERS' JOURNAL 920 Broadway, New York City.

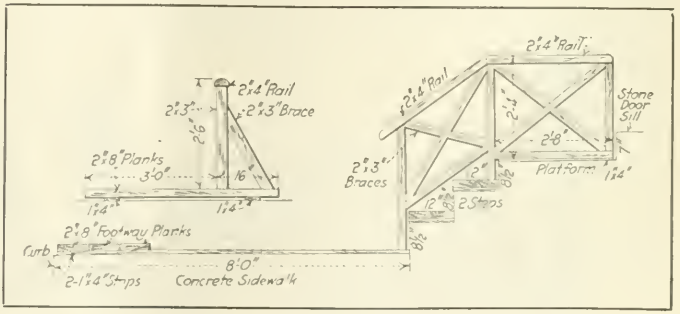
Storm Platforms and Steps

THE attached sketches show how simple platforms and steps across and on either stone, brick or concrete sidewalks, stoops, piazza, etc., may be cheaply and quickly constructed.

The covering or footway from the curb line to the bottom of the first step is 8-0 feet in length made up of 1x4 yellow pine flooring strips on which is placed 2 x 8 good spruce planed planks nailed from the under side and spaced 3/8" to permit rain or snow to percolate through and keep the top surfaces dry. The width is 3 feet to permit two persons to pass each other conveniently. The steps are made up of 2" x 6" spruce planks nailed as before to the flooring strips underneath. A hand rail 2" x 3" and 2" x 4" scantlings is placed on the right-hand side of the steps and entrance platform.

By reason of the frost and snow rendering concrete and stone surfaces slippery and dangerous to life and limb these platforms and steps which are portable should be provided for Winter weather for houses, flats, apartments, offices and public buildings.

They can be removed in the spring, stored away carefully in cellars and basements for use the following Winter. Any janitor who can use a hammer and screwdriver can put them up and take them down in a short time.—**Owen B. Maginnis.**





Legal - Department

FUNDAMENTAL legal principles prevent litigation in a suit of matters as to which there is not a joint interest on the part of several plaintiffs and a joint responsibility on the part of several defendants. It was unsuccessfully sought to invoke the rule in the case of R. R. Kitchen & Co. et al. vs. Local Union No. 141 et al., 112 Southeastern Reporter, 198, a suit brought by members of the Building Construction Employers, an association, to restrain various building trades labor unions, their officers and members, from carrying on a conspiracy to prevent plaintiffs from executing their construction contracts, by threats, violence, picketing and other illegal strike measures. Upholding the right of the several plaintiffs to maintain the single suit against the several defendants, the West Virginia Supreme Court of Appeals says, in part:

Right of Employers to Join in Restraining Unlawful Strike Measures

"Ordinarily, one class of contractors might not have any interest in wage scales pertaining to the business of other classes and not directly affecting them. However that may be, this bill alleges the extraordinary case of an association of contractors to enforce a demand for a reduction of wages in all vocations, and the organized workmen in all the building branches of labor to resist it. In the effort to maintain their position and accomplish their declared purpose, the former have jointly proclaimed inauguration of the open shop in all of their respective departments of industry and are endeavoring to maintain it, by prosecution of their business with labor employed at what they conceive to be reasonable and fair wages and without reference to affiliation with any labor organization.

"The allegations of inducement to the breaking of contracts of service, by persuasion, express and implied threats, and actual violence, and of joint perpetration or procurement thereof are as full, complete and definite as such charges can be made, ordinarily, in cases of this kind. The wrongful acts are alleged to be of constant occurrence and unrestricted scope. They occur around the employment agency, along the streets, at the places of work, and about the lodgings and homes of the employees. They are directed against the business of the plaintiffs through their employees, wherever and whenever they can obtain any workmen. Their generality, pervasiveness, constancy, and similarity are significant of concert and direction, such as might characterize the activities of a committee of action representing all of the defendants, and the bill alleges that they are emanations of confederacy and conspiracy on their part. In our opinion, the sufficiency of these allegations is beyond doubt."

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age and The Builders' Journal, 920 Broadway, New York City.

FROM a New England builder our views are asked on the following stated case: He contracted to build certain structures "at actual cost of labor and materials, plus five per cent. profit. It is understood that liability and builder's insurance is to be placed on the above work and considered part of the cost," etc.

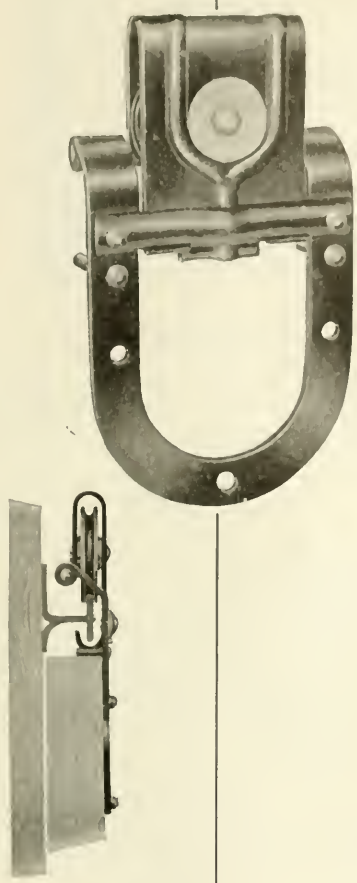
Liability Insurance Premium As Part of Contract "Cost"

The work was completed and paid for, excepting an item covering the cost of the liability insurance. The owners claim that the builder did not carry "the right kind of policy" for his and their protection.

In the absence of more particulars, and especially as to what the claimed defects in the insurance effected were, we are unable to give a definite opinion which we should be willing to have followed without regard to the undisclosed points. However, it may be found that the case will fit within one of the general rules of law stated below.

If no binding insurance was effected, and if the builder did not reasonably pay premiums to effect such insurance, the owners' non-liability appears to be clearly established by a decision of the highest court of the land. In the case of Tillson et al. vs. United States, 9 Supreme Court Reporter, 255, the United States Supreme Court decided against the right of petitioners to recover for premiums for insurance covering granite sold and shipped to the Federal Government. The court said:

"The first claim is based upon the clause in this contract by which the United States agreed to pay to the petitioners 'the full cost of the said labor, tools, and materials, and insurance on the same.' The petitioners contend that the insurance thus agreed to be paid for is insurance on the cost of labor, tools, and materials used; that is to say, on that part of the value of the cut granite which was represented by the cost of the labor, tools, and material used in cutting and boxing it. We have not found it necessary to consider whether the words 'insurance on the same' mean insurance on the granite, or insurance on the cost of the labor, tools and materials used in cutting and boxing it, or only on the materials so used; because, it being found as a fact that the petitioners never did effect or pay for any insurance whatever, we are clearly of opinion that they are not entitled to recover anything for insurance. The United States have not agreed to obtain insurance, or to become insurers themselves, but only to pay to the petitioners the 'cost of insurance,' which is as much as to say, *'reasonable premiums of insurance paid by the petitioners.'* By the terms of the contract the United States are no more bound to pay for insurance which has not been effected, than for tools or materials which have not been used, or for labor which has not been performed."



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Such time as we have been able to bestow on this inquiry has failed to reveal any court decision having a closer bearing on the subject than this decision of the Supreme Court. But we deem it sufficient to indicate the true principle applying to cases of this kind. We interpret it as saying that the contractor is entitled to credit for premiums *reasonably* paid.

If a reasonable effort was made to effect binding insurance, and if premium for such insurance was reasonably paid, we are convinced that the builder is entitled to recover on the disputed item. A lawyer undertaking to obtain proper insurance would not be regarded as impliedly making an absolute guaranty that the insurance would be binding, under pain of losing right to compensation for his services in the matter and reimbursement for his expense. The lawyer would merely be held to the exercise of such care and skill as would be required by the circumstances. For stronger reasons, a builder, under a contract like that here presented, is not bound at his peril to make sure that court-proof insurance is effected. If he does what a reasonably prudent builder would do under the same circumstances he does all that the law requires of him.

The language of the contract here presented and the remarks of the United States Supreme Court in the case presented to it show that agreements of this kind place the builder's duty concerning obtaining insurance on the same plane as his duty concerning the obtaining of labor and materials and their use in the construction work. Both duties merely require the exercise of reasonable care and skill.

The general rule as to a builder's duty being merely to use ordinary or reasonable care and skill is stated at pages 749-750, 9 Corpus Juris, with a citation of numerous decisions of courts of last resort. And that this rule applies to cost and percentage contracts is shown by the decision of the New York Supreme Court in the case of Title Guaranty, etc., Co. vs. Pam. 155 New York Supplement, 333. The court states this as the limit of what an owner may expect under such a contract: "He has the right to expect the same skill and ability to be applied to his work that it (the construction company) would give to a work where its profit was dependent upon its ability to do the work at a cost less than the contract price."

Let it be supposed that the builder in this case, after using all due and proper diligence to employ only honest and industrious men on the work, had found that some of the employees were dishonest and inefficient, doing more harm on the work than good, but that the builder immediately discharged them on discovering their shortcomings. Clearly enough, he would not have been deprived of right to full credit on account of wages paid to them before discovery or opportunity for discovery of the unfitness of such employees.

Or, let it be supposed that despite the exercise of all reasonable skill and care in selecting building materials it should have later appeared that, because of latent conditions, some of the materials had proved worthless. The builder's right to credits in his accounts for money reasonably paid for such materials would seem to be clear.

For the same reasons, it must be held, in our opinion, that the builder's right to reimbursement for insurance premiums actually, fairly and reasonably paid is undeniable.

But if he paid a premium without any policy issuing at all, or if he vitiated the insurance by inexcusably making some material misrepresentation of fact in applying for the policy, or if he did something else which must be said to have been careless or wrongful and thereby failed to effect any binding insurance, it is both just and lawful that he be denied allowance against the owners for an expense which so proved to be fruitless through his own failure to use that skill and care which a reasonably prudent builder would have used under the same or similar circumstances.

Performing Stone Cleaning Contracts

A STONE cleaner and general contractor agreed in writing "to clean down thoroughly all the front and side of" defendant's building. The front was of stone and the side of brick. The contractor, by the use of chemicals, steel brushes, sponges and water, cleaned the superficial area of the front and side, but on completion of the work stains on the stonework were plainly visible. These stains appear to have been the outward evidence of saturations several inches in depth.

When the contractor sued for his compensation defendant resisted liability on the ground that the contract had not been sufficiently performed. The trial judge upheld the defense and ordered dismissal of the suit. But in the case of Krauth vs. Harris, 194 New York Supplement, 526, the Appellate Term of the New York Supreme Court reversed the decision and ordered a new trial, holding that the trial judge erred in permitting plaintiff to testify that before the contract was entered into the stains were mentioned and defendant undertook to remove them. The presiding judge of the appellate court said:

"I think the agreement, as it was expressed in the writing, is susceptible of but one construction, which is that the plaintiff undertook to do no more than clean the superficial area, and thus it was error to admit parol evidence to show the meaning of language that we think is plain, and refers only to superficial area."

The higher court says that if the written contract failed to express the true agreement defendant should have sought a reformation of the instrument by court proceedings.

Right of a Student Architect to Compensation for Services

A SHORT time before I graduated from a school of architecture," writes a young New Yorker, "I was employed by a man to prepare a set of plans to build a five-room house. After I got bids from the contractor and informed the owner of the total cost of the house, he refused to pay me for my services; claiming that the building will cost more than he intended to pay. I expect my architect's license soon. Can I recover in this case?"

If you represented yourself to be an "architect," without disclosing that you were merely an ungraduated student in architecture, we are of the opinion that you have no right to recover.

Section 77 of the General Business Law of New York, as amended in 1921, declares that one who did not practice architecture in the state before the act took effect (1915), "shall before being styled and known as an architect, secure a certificate of his qualifiation," etc. As amended, the law provides that it shall not "prevent persons other than architects from filing applications for building permits or obtaining such permits."

It seems, under this law, that if you held yourself out as an architect your violation of the law would preclude your recovering compensation for your services. However, if the owner understood that you were still a student we do not believe that he could invoke your lack of certificate as an architect to defeat your compensation.

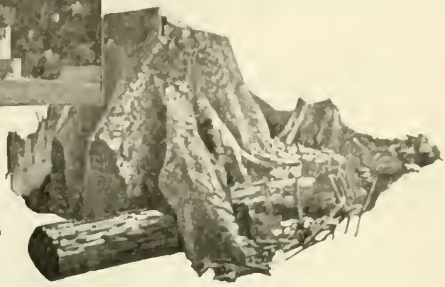
On establishing a right to compensation, the amount would be controlled in the first instance by any agreement on the subject. If no rate or amount was agreed on, you would be entitled to reasonable pay, which might be held to be less than a registered architect would be entitled to under the same circumstances.

Assuming that your lack of registration is no bar to your recovery, your letter still fails to show a right to recover anything, because you do not state the nature of the agreement you had with the owner. However, the mere fact that it may cost more to construct the house than the owner expected will not defeat your right to pay. If he did not disclose to you a cost limitation beyond which he was unwilling to go, and if you prepared plans in accordance with the ideas he gave you as a basis for doing your work, no reason is perceived why you should not recover.

As a practical matter, your proper course is to place your claim in the hands of a local attorney if the owner refuses to make a satisfactory adjustment.



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For the convenience of architects and builders we have recently issued our "Construction Digest" and our "Engineering Digest," which either our Chicago or New York office will gladly forward upon request. Write for them.

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OFFICE and JOB MANAGEMENT

Things the other man has found out that save money



Designing and Estimating Roof Work

By I. P. HICKS

THE styles of roof, methods and cost of construction, and easy ways of estimating the material and labor for the same is a matter of considerable importance and interest to the carpenter and contra tor.

First we want to say a little about the styles of roofs. The styles of roofs and the proportions of their shapes and sizes to fit the house have just about as much to do with the appearance of the house as selecting an appropriate hat for a lady.

Figures 1, 2, 3, and 4 represent four styles of roof in general use. These, when used singly or in combination and with variations to meet the different requirements of different buildings, constitute the larger part of the roofing of the average building.

Figure 1 represents a plain gable roof, which is one of the most common and easily constructed roofs. As to the style of this roof, it is almost always of the plainest type. Yet to choose a proper pitch for the roof and a proper width for the cornice, according to the width and height of the building, will have much to do with its general appearance.

If it is a building with 12 to 18 feet studding, 18 to 26 feet wide, with a plain box cornice, the horizontal projection of the cornice plancer should be from 18 to 24 inches and the pitch of the roof from 7 inches to 12 inches rise to the foot run of the common rafter, using the wider cornice and steeper roofs on the higher and wider buildings.

Where buildings are finished with a bungalow cornice, the projection of the cornice is often 2 feet to 2 feet 8 inches, and in some cases as much as 3 feet, even 4 feet in some of the so-called "prairie designs" of houses.

We will not attempt to lay down any definite rule for determining all these variations in dimensions, as it is a matter mostly of good judgment with the designer, but it is a sure thing that good proportions in designing the cornices and roof add very much to the general appearance of the completed building, and it is well worth while for the carpenter and contractor who has more or less of this to do to study up some on the art of designing and proportioning of his work so that it will produce the most pleasing results.

In our opinion a plumb cut on the ends of the rafters, so that the fascia stands plumb, always looks best, although it is not always the easiest of construction.

Estimating the Roof

NOW, something about estimating the material and labor for the roof. This can quite readily be estimated by the square. Sometimes in making an estimate the length of the rafter is not quite exactly known and it may be that the contractor has no way at hand to determine the length of rafter, or does not want to take the time to figure it out just at the moment.

It is easy to figure the cost of this work without stopping to figure the length of rafter required. Add the horizontal projection of the cornice to the size of the building, on each side and each end of the building and proceed as follows:

Multiply the length of the building by the width, and for the different pitches add the following per cents, which will make the amount of space to be covered for the different pitches:

For a 6 x 12 pitch add 12%
For a 7 x 12 pitch add 16%
For an 8 x 12 pitch add 20%
For a 9 x 12 pitch add 25%
For a 10 x 12 pitch add 30%
For a 12 x 12 pitch add 42%
For a 15 x 12 pitch add 60%
For an 18 x 12 pitch add 80%

The above figures will give the exact amount of roof surface, and it is applicable to either gable, shed or hip roofs of any shape or size, or where there are both hips and gables on the same roofs of about the same pitch. We do not use it on gambrel roofs because there is too much difference in the pitch of the two roof sections.

In the case of dormers on roofs it is necessary to add the number of feet included in the dormer cornice because the dormer cornice projects over the main roof. The dormers cut out a portion out of the main roof where they are placed, and the roofing of the dormer just about equals this space plus the amount necessary to cover the dormer cornice.

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This makes easy figuring when it is thoroughly understood. It is also advisable to put in some for good measure, for there is liable to be more or less waste cutting in and finishing around dormers.

Having obtained the number of feet roof surface, divided by 100, which will give the number of squares of roofing, the roof sheathing can be figured from the number of feet at the local price of lumber per M.

Where the roof sheathing is put on about 2 inches apart, as for shingle roofs, it is not necessary to figure any for waste, for the spreading of the boards will fully make up for the waste. If the roof is to be sheathed tight, then add to the above amount 6 per cent to cover the waste in cutting.

The feet board measure per square required for rafters in ordinary roof framing is about:

Size of timber	16-inch centres feet	20-inch centers feet	24-inch centers feet
2x4	64	56	48
2x6	96	84	72
2x8	128	112	96

On the framing the labor can be figured at from $16 to $20 per 1,000 feet of timber, figuring the higher rate for roofs that are complicated and require more cutting and framing. By this method the feet of sheathing can be readily found, the number of squares of roof, the feet board measure of rafters, and then the cost of labor on any part, or the entire roof can be determined.

The number of shingles required per square laid 4½ inches to the weather will be about as follows: On plain roofs, 900. On hip and valley roofs, where there is much cutting, 1,000. The labor can be figured at $3.00 per square on plain roofs and $4.00 per square on hip and valley roofs where there is lots of cutting to do.

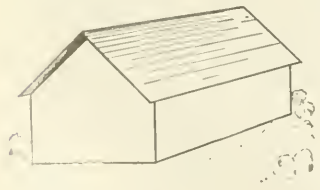
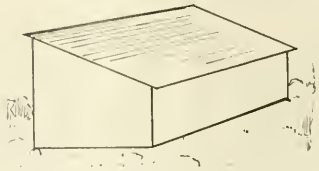


Fig. 1—Gable End Roof.

Other Common Roof Types

FIGURE 2 represents a shed roof, which is one of the simplest forms of roofs. It is used principally on additions to the main roof and in the construction of dormer roofs, particularly on roofs of the bungalow type. Shed roofs as a rule do not have a very pleasing appearance, yet by taking care to proportion the cornice so that it does not look out of place or botchy in construction, they can be made to look fairly well and sometimes very good for the places where



Fif. 2—Shed Roof.

they are used. As a rule, they are cheap in construction as regards material and labor and can be figured on the same basis as the plain gable roof. The shed roof is one rectangle, while the gable end roof is simply two rectangles.

Figure 3 shows the outlines of a plain hip roof. In this kind of a roof there is, of course, more time consumed in the framing, sheathing and shingling, and it is neces-

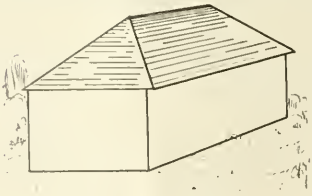


Fig. 3—Hip Roof.

sary to figure more for labor. If the roof has numerous hips and valleys, then the framing should be figured as high as $20 per thousand feet and the shingling as high as $4.00 per square.

Figure 4 shows the outline of a gambrel roof. There is nothing difficult or expensive about this form of roof, and it can be figured on a basis of $16 per thousand for the framing and $3.00 per square for the shingling.

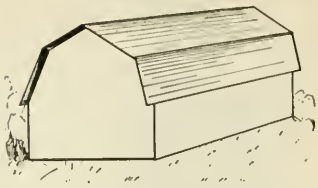


Fig. 4—Gambrel Roof.

The gambrel roof has no real pleasing effect, so far as appearances go, but it makes a fairly strong roof, and in house building it makes nearly a two story house out of a one story building, because the first section of the roof is so steep it makes the second floor space nearly all available for use in the rooms. In house building, the first roof section is seldom sloped in more than two feet at the top.

GOOD roofing tin is considered one of the standard roofing materials for buildings of the better type. It has qualities which peculiarly fit it for roofing purposes.

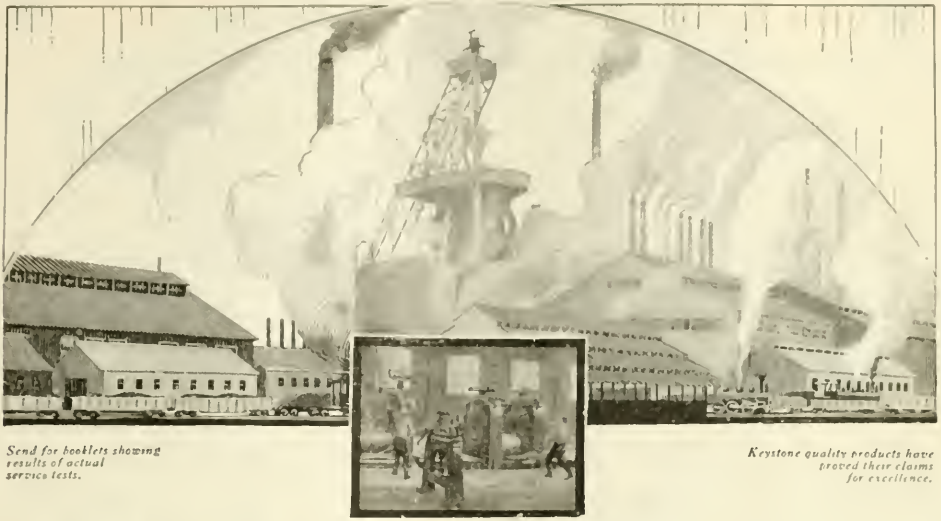
A good tin roof is light in weight and requires light roof construction. Tin is easily put on and is adaptable to any surface, whether it be a flat deck or a vertical wall.

If it should become damaged, it can be quickly and cheaply repaired, a leak being permanently fixed in a few minutes. It is impervious to moisture, as it covers the surface of the roof with a continuous, unbroken sheet of metal, no seams serving to admit rain.

In case of fire from within, the tin roof acts as a blanket for the flames, smothering them and preventing the upward draft which often carries burning embers to a distance.

Before laying, a tin roof should be painted with one coat on the under side, and the upper surface should be carefully cleaned and immediately painted, all coats to be applied with a hand brush and well rubbed on.

Inasmuch as gutters are the natural receptacle for dirt, leaves, etc., they should be swept and painted every two or three years. The roof itself will not need painting more than at five or six-year intervals. Each painting restores a roof of good tin to its original condition.



Send for booklets showing results of actual service tests.

Keystone quality products have proved their claims for excellence.

SEVERE Service Conditions

demand better material. The metal which goes into the roofing, siding, and structures of great steel mills and industrial plants, must *resist rust* to the highest possible degree. Keystone Copper Steel Sheets and Roofing Tin Plates give *maximum service and rust-resistance* not only for industrial uses, but for residences, public buildings, and all forms of construction work to which sheet metal is adapted.

The high reputation of our products is recognized wherever sheet metal is used. Each brand of our manufacture has behind it a service—the scope of which has a tangible value to every architect, contractor and builder. This service begins with the planned care and skill in the making, which is carried through to the thorough system of distribution which keeps these products obtainable in every part of the country. For roofing, siding, gutters, spouting, eaves trough, sheet metal and tin work, use Keystone Copper Steel Galvanized Sheets and Roofing Tin Plates—best for both builder and property owner. Sold by leading metal merchants, and used by the leading contractors.

KEYSTONE
COPPER STEEL

Keystone Copper Steel is an alloy made by the addition of a certain percentage of Copper to well made Steel, thereby greatly increasing its lasting and rust-resisting qualities under actual service conditions. It has been scientifically developed and tested—and its use is strictest economy.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

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Chicago Cincinnati Denver Detroit New Orleans New York Philadelphia Pittsburgh St. Louis

Export Representatives: United States Steel Products Company, New York City
Pacific Coast Representatives: United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle

News, Notes and Comment

Fire Protection for the Small Houses

FIGURES published by the National Board of Fire Underwriters indicate that the loss to buildings for a five-year period from 1916 to 1920 amounted to a total of $1,672,722,677. This is equivalent to 334,000 dwellings costing $5,000 each. Of this sum, figures show that a $223,000,000 loss was sustained through roof fires, that is, from sparks and flying embers carried by high winds to the roofs of nearby buildings.

As there are a very large number of buildings with wood shingle roofs in our country, a simple plan to make them safe from this danger has been suggested and this is to run a perforated pipe along the ridge of such buildings and have this connected with the water supply. By opening a valve a spray of water will fall on the roof and form a water curtain, which would effectively stop any small flying embers from igniting the roof.

The water could be controlled by a valve at a convenient location either inside or easily reached from the outside.

The perforated pipe should preferably be made of brass or lead as they would stand the exposure to the weather.

This little scheme does not cost much to install and it would give some desired protection from such fires.

Planning for the Future of New York

CITIES have a habit of growing in directions not exactly looked for by their original planners; still proper planning has accomplished wonders. Many people who have visited Washington have wondered why the Capitol has its back to the principal part of the city. When Washington was originally laid out, it was intended that the city should grow eastward, and therefore the Capitol was faced that way.

The Russell Sage Foundation has undertaken the work of planning for the future of New York and its environs. The committee in charge will propose no abnormal expansion of public expenditure. With a wisely conceived plan public funds which will be expended in any event can be directed into projects of permanent constructive value; without a plan millions are likely to be wasted in desultory or ill-considered public works.

City planning requires imagination, it requires vision; it requires a long continuing study of facts, and it costs a substantial sum of money. There is no public treasury which can be drawn upon to create such a plan, for no one governmental agency has jurisdiction over all of that area which includes portions of three states and many municipalities.

After these inquiries have laid solid foundations upon which to base sound planning, the man, or the group of men, will be found to plan for New York and its environs as George Washington and Pierre l'Enfant planned for Washington, or Burnham and Bennett and their committees of business men planned for Chicago; to create a plan which, with wide public participation and approval, shall embody and record the best thought of our engineers, our artists and architects, our public servants, our social workers and economists, and far-seeing business men.

Why Lumber Is Steamed During Kiln Drying

FROM the questions asked by numerous students taking the short courses in kiln drying at the Forest Products Laboratory, Madison, Wis., it is evident that many who operate kilns and handle lumber do not understand the object of steaming lumber in a kiln. There seems to be a common impression that the purpose of steaming lumber is to "remove the sap." This is far from being the fact, for when lumber is steamed it takes on moisture, as a rule, instead of giving off anything.

The reason for steaming lumber during drying depends on when it is done, but nearly always the treatment is given for one of the following purposes—(1) to heat lumber through quickly at the start; (2) to relieve stresses which otherwise would produce checking, casehardening and honeycombing; (3) to equalize the moisture content and condition the lumber ready for the use at the end of the run; (4) to kill fungi and insects in the wood.

When lumber should be steamed, how long the treatment should last, and what temperature should be maintained are points which have been determined at the Forest Products Laboratory by experiments on many species of wood. A thorough understanding of the steaming operation is essential, because the whole kiln charge can easily be ruined by too severe a treatment. One of the chief needs of many commercial kilns is proper steaming facilities, without which a high degree of success in the artificial seasoning of wood is impossible.

Book Notices

The Home Painting Manual; 168 Pages; Published by the Sherwin-Williams Company, Cleveland, O.; Price, 50c.

Here we have a really practical book on the subject of painting the house both inside and out. It is excellently illustrated by a number of colored illustrations besides black and white illustrations in the text. The chapters on the right use of painting and estimating will prove of interest and value to any builder as well as the remarks on finishing the interior woodwork and floors. Its many practical points will form a guide of what to do to get best results on this important branch of the building industry.

The Sanitation of Bath Houses by Wm. Paul Gerhard; 16 Pages; Price, 60c.; Published by Wm. T. Comstock Company, New York.

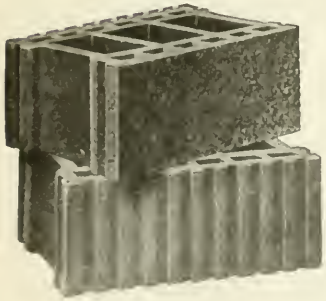
To any builder who is called upon to erect a swimming pool or bath house, this pamphlet contains some very interesting information and data It is well illustrated by pictures and plans of different bath houses, both public and private.



Hospital, Wilberforce University, Wilberforce, Ohio, F. L. Packard, Columbus, Ohio, Architect

Permanence, Safety and Beauty— With Economy

THE walls of this attractive and modern school hospital assure lasting fire-safety, protection and comfort for generations to come. Built of beautiful NATCO Tex-Tile with its blended rich, dark brown shades, it is a worthy addition to the group of buildings of which it is a part.



NATCO glazed Tex-Tile, outside face 5 inches x 12 inches. Inside dovetail keyed. Easily and quickly handled and laid.

Each year more architects, builders and building supply dealers realize the merit, popularity and profit of NATCO Tex-Tile. The hollow spaces of the tile form a blanket of protecting air that insures interior comfort through summer heat and winter cold. By the use of NATCO Hollow Tile, through-the-wall mortar joints are eliminated, so that there is no chance for the penetration of moisture. Last, but not least, NATCO Tex-Tile is decidedly economical, because its units are large and easily laid.

"The Home Beautiful," a small circular describing NATCO Tex-Tile in detail and showing Tex-Tile wall sections in color will be sent free on request. This piece of advertising literature is worth while for showing building prospects.

Write for it today

NATIONAL·FIRE·PROOFING·COMPANY

1429 Fulton Building, Pittsburgh, Penna.

NATCO HOLLOW TILE

Review *of* Building Situation

BUILDING statistics for September, just published by F. W. Dodge & Company, show that the volume of contracts awarded for the past nine months of this year is greater than any total recorded and is 51% greater than the figure for the first nine months of 1921.

The total of contracts awarded for September, 1922, is the highest September total on record, being 11% greater than the figure for the corresponding month of 1921. This, despite the fact that September, 1921, total was a 16% decline from August. Of course, a seasonal decline is to be expected at this time of the year, but the fact that the total is higher than last year indicates continued healthy prosperity.

Business and industrial buildings show a very active condition in all districts. This is especially true of the Middlewest District which has been rather behind in the building program. Residential construction in this district also shows signs of a healthy increase.

Residential construction in practically all districts still leads and a surprising fact is that although this is the time for a seasonal decline, the total is a little greater than that of the August record. Residential construction in the Pittsburgh, Middlewest and Northwest districts shows a decline from the August figures, but the New England, New York and Middle Atlantic districts show increase, the largest being nearly $5,000,000 in the New York district.

The total amount contracted for residences during September, amounts to $101,428,000, this representing 9,269 separate buildings, bringing the average cost of a structure to a little over $10,900.

It is rather interesting to compare the amount of residence construction in the different districts, especially the figures for contemplated construction.

Of the $134,093,600 worth of residential construction contemplated the sum of $81,319,300 will be expended in the Eastern states. This amounts to a little more than 60% of the entire total which shows that the demand for residence construction has still to be met very decisively in the East and it is one of the best signs for builders of this class of structures as a forecast for next year's business.

This amount of money is contemplated to be spent on 12,089 separate buildings, 2,889 are to be built in the Middle and North West Districts with 1,753 in the Pittsburgh district, while in the Northeastern states, the number is 7,447, or 60% of the total.

Record of September, 1922, Building Contracts Awarded

Classifications of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$9,100,000	$10,873,000	$5,355,500	$6,425,800	$12,378,000	$1,774,700	$45,907,000
Educational	1,529,600	6,075,200	3,749,600	2,637,800	6,623,900	597,400	21,213,500
Hospitals and Institutions	2,103,600	653,000	640,200	986,200	934,000	13,500	5,330,500
Industrial	2,092,300	2,709,400	2,266,600	10,338,200	8,702,000	276,000	26,384,500
Military and Naval	.....	32,000	120,000	.....	110,000	.....	262,000
Public Buildings	100,000	837,500	116,000	121,100	150,000	.....	1,324,600
Public Works and Utilities	2,219,800	4,681,000	7,470,700	11,480,200	24,469,400	58,000	50,379,100
Religious and Memorial	533,000	1,394,400	911,300	1,334,000	3,053,500	32,500	7,258,700
Residential	12,125,200	33,720,100	18,017,400	13,327,500	22,136,200	2,101,600	101,428,000
Social and Recreational	565,000	2,005,400	1,104,400	1,490,200	6,732,900	106,000	12,004,900
Total	$30,368,500	$62,982,000	$39,751,700	$48,141,000	$85,289,900	$4,959,700	$271,492,800

Building Projects Contemplated, September, 1922

Classifications of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$4,586,400	$13,800,500	$5,322,900	$4,924,200	$12,173,500	$1,604,700	$42,412,200
Educational	2,560,500	3,621,200	2,095,200	5,126,000	7,013,000	1,290,500	21,706,400
Hospitals and Institutions	625,800	4,842,000	1,386,000	885,000	1,631,000	13,500	9,383,300
Industrial	2,687,300	6,550,600	4,099,000	13,451,200	8,981,000	2,310,000	38,079,100
Military and Naval	15,000	10,000	60,000	30,000	100,000	.....	215,000
Public Buildings	99,500	544,500	37,000	684,500	4,082,100	146,600	5,594,200
Public Works and Utilities	2,379,400	9,960,300	5,959,700	7,841,700	40,906,100	1,962,500	69,009,700
Religious and Memorial	1,387,000	1,394,400	659,300	315,000	2,299,500	43,500	6,098,700
Residential	14,611,100	40,362,400	26,345,800	15,261,800	33,302,500	4,210,000	134,093,600
Social and Recreational	938,100	2,083,500	2,043,000	2,661,200	5,333,000	1,150,000	14,208,800
Total	$29,890,100	$83,169,400	$48,007,900	$51,180,600	$115,821,700	$12,731,300	$340,801,000

ATKINS
SILVER STEEL SAWS



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Narrow point saws have become very popular among carpenters who like a light saw. To meet this demand we are making ship point saws in all our popular numbers.

Notice the last saw in the illustration —this is a ship point saw, fitted with our Perfection Handle.

We can furnish Atkins Saws—wide or narrow point—straight or skew back—fitted with either the old style straight across handle or the new Perfection handle.

Take no substitute, demand genuine Atkins Silver Steel Saws.

Send twenty-five cents for carpenter apron, pencil and "Saw Sense" booklet.

E.C. ATKINS & CO.

ESTABLISHED 1857 THE SILVER STEEL SAW PEOPLE

Home Office and Factory, INDIANAPOLIS, INDIANA

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Branches Carrying Complete Stocks In The Following Cities:

Atlanta	New Orleans	Seattle
Memphis	New York City	Paris, France
Chicago	Portland, Ore.	Sydney, N. S. W.
Minneapolis	San Francisco	Vancouver, B.C.

Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	Sept. 28	Oct 28
LONG LEAF YELLOW PINE—		
B. and Better Edge Grain Flooring, 13/16x2½" Face	$83.50	$91.00
Dimensions, S1S1E, No. 1 Common, 2x4", 10'	37.00	44.00
Timbers, Merchantable, '05, 12x12", 10 to 20'	53.00	58.50
B. and Better Ceiling, ½x3¼	47.00	47.00
B. and Better Partition, ¾"x3¼"	63.00	65.00
B. and Better Finish, 1x4"	67.00	67.00
No. 1 Common Boards, 1x8"	49.25	49.25
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13/16x2½"	$65.00	$66.00
Roofers, 13 16x3½"	33.50	35.50
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3"	$75.00	$75.00
No. 1 Clear V. G. Flooring, 1x4"	73.00	75.00
No. 2 Clear and Better Ceiling, ½x4"	53.50	50 50
No. 2 Clear and Better Novelty Siding, 1x6"	54.00	54.00
No. 2 Clear and Better V. G. Stepping	94.00	91.00
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M	$7.68	$7.68
Washington Perfection Shingles, per M	7.42	7.42
Clear Bevel Siding, ½x6"	52.50	52.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½"	$9.25	$9.25
Dimension, 2x4", 10 to 16'	34.00	34.00
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2x2¼"	$157.50	$158.50
Clear Plain White Oak, 13/16x2¼"	113.50	113.50
Clear Plain Red Oak, 13/16x2¼"	113.50	113.50
Clear Maple, 13/16x2¼"	103.00	103.00
(All lumber prices furnished by National Lumber Merchant)		
COMMON BRICK—		
Per M. f. o. b. job	$20.60	$20.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered	$2.90	$2.90
STRUCTURAL STEEL—		
Per 100 lb. at warehouse	...	$3.14
CRUSHED STONE (cu. yd.)—		
¾ in.	$2.85	$2.90
1½ in.	2.70	2.75
WALL BOARD—		
Per 1,000 sq. ft. in lots under 1,000 sq. ft.	$50.00	$50.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.	45.00	45.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered	$20.00	$21.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered.	22.00	23.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	22.00	23.00
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag	$0.60	$0.50
Masons, per 50 lb. bag	.45	.49
SAND AND GRAVEL—		
Sand (per cubic yard)	$1.65	$1.55
¾ in. Gravel (per cubic yard)	2.85	2.90
1½ in. Gravel (per cubic yard)	2.85	2.90
FACE BRICK—		
Tapestry (delivered)	$46.00	$46.00
Caledonian (delivered)	43.00	43.00
Smooth Grey (delivered)	47.00	47.00
Red Lot f. o. b. factory	36.00	36.00
SHINGLES—		
Asphalt, Single (per square)	$8.25	$8.25
Asphalt, Strip (per square)	6.50	6.50
STAINED WOOD SHINGLES—		
16 in. Extra Clear (per square, delivered)	$11.00	$11.00
18 in. Eureka (per square, delivered)	11.00	11.00
18 in. Perfection (per square, delivered)	12.00	12.00
24 in. Royal (per square, delivered)	12.25	12.25
24 in. Imperial (per square, delivered)	12.50	12.50
VITRIFIED SEWER PIPE—		
4 in. (cents per foot)	$0 12	$0 12
6 in. (cents per foot)	.18	.18
SLATE ROOFING—		
Bangor or Slatington, 8x16 in. (per sq. at quarry)	$8.40	$8.40
CORNER BEADS (Galvanized)—		
Per Foot	$0.06	$0.05
WALL TIES (Galvanized)—		
Per Thousand	$5.00	$5.00
FLUE LINING—		
8½ x 8½ in. Per Foot	$0.30	$0.33
8½ x 13 in. Per Foot	.47	50
HOLLOW TILE—		
8 x 12 x 12 in., heavy. Each, delivered	$0.27	$0.22½
HAIR—		
Per Bushel	$0.60	$0.60
PLASTER BOARD—		
32 x 36 x ⅜ in., Each	$0.30	$0.25
MAGNESITE STUCCO—		
Per Ton	$65.00	$65.00
TILE—		
1 in. Square or Hexagon, White, per sq. ft.	$0.25	$0.25
3 x 6 in. White Wall	.60	.60
8 x 8 in. Red Floor	.45	.45

CHICAGO PRICES

	Sept. 28	Oct. 28
YELLOW PINE—		
Boards, 1x8, No. 1 Com	$43.00	$43.00
Ceiling, ½x4, B. and Btr	50.00	48.00
Dimension No. 1, 2x4, 12 to 14 ft	40.00	36.00
Drop Siding, 1x6, B. and Btr	57.00	55.00
Finish, 1x4, B. and Btr	64.00	62.00
Flooring, B. and Btr. E. G., 1x3	80.00	85.00
Lath, 4 ft., No. 1	8.00	8.00
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	44.00	47.00
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear	$99.75	$99.75
Oak Flooring, ¾x2, Cl. Pl., White	74.00	74.00
Oak Flooring, 13/16x2¼, Cl. Pl., White	108.50	108.50
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear	$42.25	$44.25
Finish, S2S or S4S, 1x6 to 8 in. clear	91.50	91.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear	$53.00	$53.50
Shingles, Extra Clears, 16 in	5.41	5.16
COMMON BRICK—		
Per M. f. o. b. job	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.20	$2.20
STRUCTURAL STEEL—		
Per 100 lbs. at warehouse	...	$2.90
CRUSHED STONE (cu. yd.)—		
¾ in.	$3.50	$3.25
1½ in.	$3.50	$3.25
WALL BOARD—		
Per 1,000 sq. ft. in lots under M	$45.00	$45.00
Per 1,000 sq. ft. in lots 1 M to 2½ M	50.00	50.00
SAND AND GRAVEL—		
Sand (per cubic yard)	$3.50	$3.25
¼ in. Gravel (per cubic yard)	3.50	3.25
1½ in. Gravel (per cubic yard)	3.50	3.25

ST. LOUIS PRICES

	Sept. 28	Oct. 28
YELLOW PINE—		
Boards, No. 1 Com., 1x4	$47.00	$48.50
Partition, ¾x3¼, B. and Btr	57.25	57.25
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	37.00	37.00
Finish, S2S, B. and Btr., 1x4, 6 & 8 ft	63.00	62.50
Flooring, B. and Btr., E. G., 1x3	79.00	84.25
Flooring, B. and Btr., F. G., 1x3	62.50	63.50
Lath, 4 ft., No. 1	7.75	6.75
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	39.50	39.50
CALIFORNIA REDWOOD—		
Finish, S2S, Cl., 1x6 in	$91.50	$91.50
Siding, 4 in. Bevel, 10 to 20 ft	48.00	43.25
8 inch Colonial	70.75	69.25
8 inch Bungalow	70.75	69.25
HARDWOODS—		
Oak Flooring, ¾x1½ and 2 in., Clear Qtr. White	$106.50	$106.50
Maple Flooring, 13/16x2¼ in., Clear	91.00	91.25
RED CEDAR—		
Siding, ½x6, Clear	$48.00	$48.00
Shingles, Clears, Per M	5.51	5.25
COMMON BRICK—		
Per M. f. o. b. job	$17.00	$18.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.35	$2.35
STRUCTURAL STEEL—		
Per 100 lbs. at warehouse	...	$3.00
CRUSHED STONE (cu. yd.)		
¾ in.	$1.83	$2.20
1½ in.	1.83	2.20
WALL BOARD—		
Per 1,000 sq. ft. in lots under M	$50.00	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M	45.00	45.00
SAND AND GRAVEL—		
Sand (per cubic yard)	$1.10	$1.20
¼ in. Gravel (per cubic yard)	1.30	1.45
1½ in. Gravel (per cubic yard)	1.25	1.40



"I AM DELIGHTED with Arkansas Soft Pine woodwork—it is the ideal wood for white enamel. We have lived in this home over twenty years and there is not a single sign of discoloration or raised grain in any of the woodwork. Moreover, it cost us just about half the price of other materials often considered as indispensable to a successful white finish."

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makes a *permanent friend* of every owner, builder and architect who installs it. It is the one moderate priced woodwork of such physical character as assures lasting satisfaction.

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LITERATURE AND SAMPLES ON REQUEST

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ARKANSAS SOFT PINE BUREAU

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Selected List of Manufacturers' Literature

FOR THE SERVICE OF BUILDERS, CONTRACTORS, ARCHITECTS AND ENGINEERS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to BUILDING AGE & THE BUILDERS' JOURNAL, 920 Broadway, New York, or the manufacturer direct, in which case kindly mention this publication. Either the titles or the numbers may be used in ordering.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

(See also Alphabetical Index, Page 120)

ARCHITECTS' SPECIFICATION HAND BOOK

Truscon Company, Detroit, Mich.

270. 52-page-bound, loose-leaf specification book. 8½ x 11 in.

ASBESTOS PRODUCTS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

1. *Ambler Asbestos Shingles.* Catalog 5½ x 8½ in. 40 pp. Illustrated.
2. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog. 8½ x 11 in. 36 pp. Standard Purlin Spacing Tables.
3. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog, 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
4. *Ambler Asbestos Building Lumber.* Catalog, 8½ x 11 in. 32 pp.
5. *Engineers' Data Sheets.* Catalog, 8½ x 11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.

ASBESTOS ROOFING—See also Roofing

ASH HOISTS—See also Hoists

ASH RECEIVERS

Sharp Rotary Ash Receiver Corporation, 396 Bridge St., Springfield, Mass.

7. *Catalog E.* Booklet describing the Sharp Rotary Ash Receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6 x 9¼ in.
8. *Catalog F.* A book for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with tables of dimensions for installation. 8 pp. Illus.

BALANCES, SASH

Caldwell Mfg. Company, The, Rochester, N. Y.

9. *Suggestions for the Present-Day Architect.* Booklet, 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.

Pullman Mfg. Co., Rochester, N. Y.

10. *Catalog* describes new form of sash balance that can be removed and inserted without removing sash from window.

BAND SAWS

American Saw Mill Machinery Co., Hackettstown, N. J.

11. *Catalog No. 22* describing a general line of band saws of various sizes.
12. *Technical Data.* Four-page folder 8½ x 11 in. containing specifications, description, prices and approximate cost of installation. Everything the architect or contractor requires.

Crescent Machine Co., Leetonia, Ohio.

241. Descriptive 144-page Catalog.

BAR BENDERS AND CUTTERS

Koehring Company, Milwaukee, Wis.

13. *Four-page folder,* giving illustrations and sizes of Koehring Bar Benders and Cutters.

BATHROOM FIXTURES

Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.

401. *Send for illustrated Folder,* "A Bath a Day Keeps You Fit Every Way."

BEDS

Murphy Door Bed Company, Majestic Bldg., Chicago, Ill.

402. *Eight-page illustrated,* "How to Use the Murphy Bed."

BOILERS—See Heating Equipment

BOOKS

American Technical Society, 58th and Drexel Blvd., Chicago, Ill.
Architectural House Plannnig Service Co., 20 So. 18th Street, Philadelphia, Pa.
Arrow Book Company, 347 Fifth Avenue, New York City.
Chicago Technical College, 1038 Chicago Tech. Bldg., Chicago, Ill.
U. P. C. Book Co., 243 West 39th Street, New York City.

BLUE PRINTS

Peerless Blue Print Co., 347 Fifth Avenue, New York City.

403. *Splendid Drawing Board Outfits* are manufactured in conjunction with the making of blue prints.

BRICK

American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.

15. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Sent free.
16. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions are illustrated and described. Sizes 8½ x 11 in. 116 pp. Price $1.00.
17. *The Home of Beauty.* A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8 x 10 in. 72 pp. Price 50 cents.
18. *Architectural Details in Brickwork.* Three series of beautiful half-tone prints of brickwork detail, contained in closed folders suitable for standard vertical letter file. The three series contain 124 prints in all. Size 8½ x 11 in. Price $1.50 per set.

Common Brick Manufacturers' Association of America, 1309 Schofield Bldg., Cleveland, Ohio.

19. *Brick—How to Build and Estimate.* 3rd edition, 32nd thousand, a manual of solid brick and Ideal wall construction. Contains data on the strength of brickwork, on mortars, bonds and joints and equipment, and contains complete estimating tables for quantities of brick, mortar, material and approximate mechanics' time for various thicknesses and square foot areas of solid and Ideal wall. 8½ x 11 in. 72 pp. Price 25 cents.
20. *Brick for the Average Man's Home.* Book, 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price, $1.00.

Fiske & Company, Boston, Mass.

145. *Tapestry brick, other grades of front brick.* Manufacturers "Fisklock" Brick.

BUILDING CONSTRUCTION—See also Garage Construction

National Manufacturing Co., Sterling, Ill.

404. *An 80-page catalog,* profusely illustrated with various kinds of Garage Hardware.

Truscon Steel Company, Youngstown, Ohio.

21. *Truscon Floortype Construction.* Form D352. Contains complete data and illustrations of Floortype installations. 16 pp. Ill. 8½ x 11 in.
22. *Truscon Standard Buildings.* Form D-398. Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8½ x 11 in.
23. *Truscon Building Products.* Form D-376. Contains a brief description of each of the Truscon Products. 112 pp. Ill.
24. *Modern School Construction.* Form D-395. Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill.

BUILDING HARDWARE—See Hardware

BUILDING STONE—See Stone, Building

BUILT-IN CLOTHES HANGERS

Knape & Vogt, Grand Rapids, Mich.

405. *16-page booklet,* describing the "Garment Care System."

BUILT-IN KITCHENS

Bisk Corporation, Brockton, Mass.

406. *16-page illustrated catalog,* giving the pictures and plans on the installation of the Built-In Kitchens. It describes in detail the various types and sizes.

BUNGALOW AND SMALL HOUSE PLANS

American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.

25. *Four booklets* of small houses from 3 to 8 rooms, containing 98 reversible designs. (1) 3-4 rooms, (2) 5 rooms, (3) 6 rooms, (4) 7-8 rooms; size 8½ x 11 in. Each booklet 25 cents; set, $1.00.

Architectural House Planning Service Company, 20 South 18th Street, Philadelphia, Pa.

CANVAS—See Roofing Materials

CASEMENTS—See Doors and Windows

CAULKING AND GLAZING COMPOUND

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.

246. *Illustrated catalog* sent on request.

CEILINGS, METAL

The Edwards Manufacturing Company, Cincinnati, O.

33. *Pamphlet of 32 pages,* describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 in.

Kelghley Mfg. Co., 124 Third Avenue, Pittsburgh, Pa.

407. *Catalog "M"* describes the Lock Joint Metal Ceiling.

CEMENT

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

37. *The Atlas Book on Concrete Construction.* A text book written for the average builder in concrete and from the practical rather than from the technical standpoint. Treats on both plain and reinforced concrete. 144 pp. 4½ x 7 in. Cloth bound. Price, $2.00.
30. *Set of Blue Prints.* Drawings showing how to apply Portland Cement stucco to the different standard types of wall construction. Appended are tables of the quantities of cement and sand required to cover a given wall surface.
31. *Concrete on the Farm.* The most comprehensive book of its kind. Practical and thoroughly reliable instructions, with plans and pictures of all possible farm structures for which concrete can be used. Complete directions in practical terms for selection of aggregate and the mixing and placing of concrete.



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Architect

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"BRICK—How to Build and Estimate" (25c) contains detailed information about the Ideal Wall and other money-saving methods, together with many estimating tables. $1.25 brings both this book and *"Brick for the Average Man's Home"* with the wonderful supplements illustrating these exceptional plans.

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Ideal Brick Hollow Wall

"Brick Homes at the Cost of Frame"

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 72*

32. *Other Publications.* The Atlas Portland Cement Company has numerous other publications, covering nearly every phase of concrete construction. Their Service Department will give sound advice on any phase of concrete construction to anyone applying for it.

Koehring Company, Milwaukee, Wis.
38. *Concrete—Its Manufacture and Use.* Book, 4½ x 7 in. Illustrated. 207 pp. Comprehensive discussion from the practical standpoint of concrete.

Portland Cement Assn., Washington Street, Chicago, Ill.
511. "The Concrete Builder," vol. 4, No. 6, devoted to the use of Concrete for Farm and Home. This booklet gives the definite specifications for concrete block bungalows.

CHAINS

Bridgeport Chain Co., Bridgeport, Conn.
29. *Catalog No.* 14. Contains 64 pp. Illustrated, of different chains that can be used in all parts of building construction.

CLAMPS

James L. Taylor Mfg. Co., Poughkeepsie, N. Y.
408. *Descriptive catalog* of the various Clamps.

COAL CHUTES

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.
409. *An interesting folder,* describing the advantages of the Donley Coal Chute.

COLUMN BASIS

S. Cheney & Son, Manlius, New York.

COLUMN AND BEAM COVERING

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
39. *32-page booklet,* 8½ x 11. Pyrobar Tile.

COLUMNS

Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.
233. *Catalog No. D-47.* 48 pages, illustrated. 7¼ x 10 in. Illustrating the Koll's Patent Lock-Joint Wood Columns.

CONCRETE APPLIANCES

Universal Cement Mould Co., No. Milwaukee, Wis.
41. *Illustrated Folder,* describing mold for building hollow concrete walls for homes, garages, barns, silos, etc.

Van Guilder Double Wall Co., 77 South Avenue, Rochester, N. Y.
42. *A Catalog* describing the Van Guilder system of portable forms for the building of hollow concrete walls on the thermos bottle idea for the erection of homes, ice houses, barns, silos, etc. Walls are dry, as there is continuous air space around entire building.

CONCRETE MACHINERY

A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
43. *Descriptive Illustrated Circular* of Magic Concrete Mixer.

The American Cement Machine Co., Inc., Keokuk, Iowa.
410. *An interesting 68-page illustrated catalog,* describing the "Boss" Labor Saving Construction Machinery.

Concrete Equipment Co., 535 Ottawa Street, Holland, Mich.
411. *Catalog No. 22* describes in detail the various products manufactured by this company.

Concrete Block Machine & Mold Co., 114 S. 2nd St., St. Louis, Mo.
253. *Catalogue No.* 38. Describes Building Block Machines. It is a 40-page book, 6 x 10 in.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
412. *Bulletin No.* 1 describes the Portable Saw Rigs.
413. *Bulletin No.* 2 describes the Power Driven Pumps, Centrifugal, Pistons, Diaphragm, Triplex.
414. *Bulletin No.* 3 describes the Hoists, Mortar Mixers, Material Elevators, Engines.
415. *Bulletin No.* 4 describes the Tractor.

Ideal Concrete Machinery Co., 1334 Monmouth Street, Cincinnati, Ohio.
416. *A 100-page illustrated catalog,* describing the Ideal Machine and also data for manufacturing and curing Ideal Concrete blocks.
417. *Catalog No.* 37 describes the Ideal-Cincinnatus Batch-Mixers.

Jaeger Machine Co., 216 Dublin Avenue, Columbus, Ohio.
418. *A 40-page catalog,* well illustrated, describing the special features of a Jaeger Mixer.
419. *16-page folder,* illustrating a Jaeger for every mixer need.

Koehring Co., Milwaukee, Wis.
46. *Koehring Construction Mixers.* Booklet. 7¾ x 10½ in. Illustrated. 96 pp. Complete information on construction type concrete mixers.
47. *Koehring Dandie Mixer.* Booklet, 6 x 9 in. Illustrated. 24 pp. Illustrating and describing Koehring line of Dandie light mixers.
265. *"Built to Endure."* A beautifully bound booklet of 36 pages, 7¼ x 10 in., describing Comparative Examples of Notable Ancient and Modern Construction Embodying the Element of Permanency.

Little Whirlwind Mixer Co., 438 Gould Street, La Crosse, Wis.
420. *An eight-page illustrated folder,* describing the efficiency of the Master Mixer.

Republic Iron Works, Box 602, Tecumseh, Mich.
421. *An eight-page illustrated pamphlet,* describing the Republic "Ten-X"

Standard Scale & Supply Co., 1631 Liberty Ave., Pittsburgh, Pa.
422. *28-page illustrated catalog,* describing quick, efficient and money-saving concrete mixing.

CONCRETE MARBLE

Art Stone Co., Waynesboro, Pa.
45. *Descriptive Circulars* with illustrations of different marbles in colors. Sent free to any interested party.

CONSTRUCTION, FIREPROOF

Central Steel Co., Massillon, Ohio.
423. *In the "National Steel Lumber" Handbook* is embodied complete information and authentic data pertaining to the use of Steel Lumber Sections and kindred materials.
424. *"National" Bulletin No.* 19B describes the National Shelby

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
226. *Standard Fire Proofing Bulletin* 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fireproof floor construction.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
48. *Pyrobar Gypsum Tile.* Booklet, 8½ x 11 in. 32 pp. Illustrated. Detail and specifications for fireproof partitions.
49. *Bulletins,* 8½ x 11 in. Containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

CONTRACT AND ESTIMATE BLANKS

L. Fink & Sons Printing Co., Laurel Spring, N. J.
166. *Samples* of contract sheets, estimate blanks, job tickets, time tickets, time sheets, wage receipts, etc., with prices.

CRYSTALS, MICASPAR

Crown Point Spar Co., 101 Park Avenue, New York.
276. *50-page descriptive catalog,* describing the advantages and uses of the Sparkling Micaspar Crystals.

DAMPERS AND ASH DUMPS (Fireplace)

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

DAMP-PROOFING

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.
425. *Six-page folder,* describing the Nu-Tile 4-in-1 Shingle.

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
426. *Send for catalog* on the advantages of the Asbestos Shingle.

Illinois Zinc Co., 280 Broadway, New York.
428. *An eight-page folder,* describing the roof that is always new.

National Sheet Metal Roofing Co., 339 Grand St., Jersey City, N. J.
429. *68-page book,* illustrating the "Shingles That Last."

Rockbond Co., Van Wert, Ohio.
430. *An eight-page folder,* entitled, "Fortifies Your Home Against the Element of Time."

F. C. Sheldon Slate Co., Granville, N. Y.
431. *A 16-page illustrated booklet,* describing "The Most Enduring and the Most Attractive Roof at the Most Reasonable Cost."

DOOR CHECKS

Park Manufacturing Co., Worcester, Mass.
50. *Catalog* contains description of six models of the new improved Worcester-Blount Door Check.

DOORS AND WINDOWS

The Bagert & Carlough Co., 30 Peach St., Paterson, N. J.
247. BOCA steel sash. (E-22.) A catalogue containing designing information, complete details and tables, and illustrations of standard installations of sidewall sash, monitor sash, mechanical operators, steel doors, and steel partitions. 24 pages. Illustrated. 8½ x 11 in.

Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.
432. *A 32-page catalog,* describing "Window Walls," their cost and their advantages.

Henry Hope & Sons, 103 Park Ave., New York.
51. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¼ x 18½ in. 32 pp.

Truscon Steel Company, Youngstown, Ohio.
52. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.
53. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill.

DOOR AND WINDOW FRAMES

Andersen Lumber Company, South Stillwater, Minn.
55. *General Catalog* for architects, contractors, engineers, carpenters or builders. Describes and illustrates fully Andersen Standard White Pine Window, Cellar Frames, Sash Frames and Door Frames. Gives details of construction, variety of sizes and uses for ordinary as well as special construction, and method of assembly. Size 7¾ x 10¾, 24 pages.
56. *Better Frames for Less Money* for consumers. Interesting folder showing advantages of Andersen Standard White Pine Frames. Uses, sizes and details of construction.

DRAFTING MATERIALS

A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.
433. *A 116-page book,* describing the advantages of "Direct-by-Mail" Buying.

Keuffel & Esser Co., Hoboken, N. J.
434. *A 486-page Bound Book.* This is the thirty-sixth edition of the catalog.

Peerless Blue Print Co., 347 Fifth Avenue, New York City.

Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.
435. *36-page booklet,* describing the "Sterling" Transits and Levels.

DUMBWAITERS

Kimball Bros. Co., 1106 Ninth Street, Council Bluffs, Iowa.
436. *30-page illustrated catalog,* describing the various models of Dumbwaiters.

Sedgwick Machine Works, 156 W. 15th Street, New York.
57. High grade Hand Power Elevators and Dumbwaiters for All Purposes. Illustrated catalog, 52 pages; dumbwaiter service sheet, and pamphlets descriptive of many special types of outfits.

ELECTRICAL DEVICES

Arrow Electric Co., Hartford, Conn.
General Electric Co., Schenectady, N. Y.

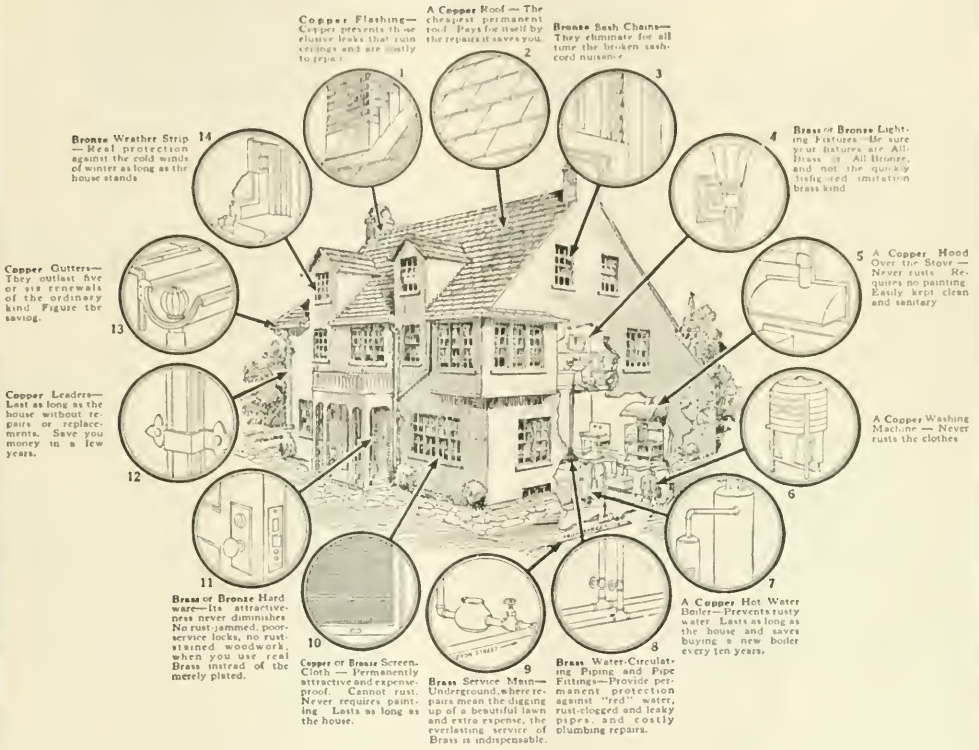
ELECTRIC METER BOXES

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

ELEVATORS

Kimball Brothers Company, Council Bluffs, Iowa.
58. *Kimball Elevators.* An illustrated catalog of hand power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7¾ x 10½ in.

A Good House



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SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 74*

Richards-Wilcox Mfg. Co., Aurora, Ill.
59. *"Ideal" Elevator Door Equipment.* Catalog showing elevator door hangers for one, two or three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.

Sedgwick Machine Works, 156 West 15th Street, New York.

ENGINES—GASOLINE

New-Way Motor Co., Lansing, Mich.
437. *Write for helps and suggestions.*

FACTORY EQUIPMENT

The Edwards Mfg. Co., Cincinnati, Ohio.
60. *Edwards' Steel Equipment.* Illustrated catalog. Showing steel lockers and shelving for factories, offices, stores, schools and hospitals, together with illustrations and description of "Edmanco" steel office furniture and filing cabinets. Size 8 x 11 in. 32 pp.

FIREPLACES AND MANTELS

Apex Fireplace Co., Urbana, Ill.
503. *An interesting four-page folder* with blue prints attached.

Colonial Fireplace Co., Chicago, Ill.

Strait & Richards, Inc., Newark, N. J.
62. *Catalog* describing fireplaces, electric and gas logs, heating supplies, heaters, etc.

FLOOR HARDENERS

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
61. *Agate and Its Performances.* Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FLOORING LUMBER

The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
63. *The Perfect Floor.* Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5½ x 7⅝ in.

Oak Flooring Advertising Bureau, 1014 Ashland Block, Chicago, Ill.
64. *Modern Oak Floors.* Booklet. 6¼ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
65. *Oak Flooring, How and Where to Use It.* Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.
257. *Oak Flooring for Factories and Warehouses.* Booklet. 3¼ x 6 in. 16 pp. Illustrated. Small general book featuring No. 2 Common Oak Flooring for hard usage in factories and warehouses, with testimonials.

Pacific Lumber Co., 2070 McCormick Bldg., Chicago, Ill.
438. *A sixteen-page treatise* on the construction Digest of Information on the Values and Uses of Redwood.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
66. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins, 8½ x 11. Pyrofill.

Wood Mosaic Co., New Albany, Ind.
227. *Catalogue* of wood-carpet, strips, plain and ornamental parquetry, tongue and groove flooring in natural wood colors.

FLOORING COMPOSITION

Everlasheetos Flooring Co., Rochester, N. Y.
439. *Sixteen-page illustrated booklet,* describing the really modern floor.

FLOOR SURFACING

Amer. Floor Surfacing Machine Co., 521 So. St. Claire Street, Toledo, Ohio.
440. *An eight-page illustrated booklet,* describing the "American Universal." Also opportunities of making money in the "American Universal Way."

Waywell Chappell & Co., 137 No. Jackson Street, Waukegan, Ill.
441. *Four-page folder,* describing the "Little-Automatic Electric Surfacing Machine."

M. L. Schlueter, 223 W. Illinois Street, Chicago, Ill.
442. *Eight-page illustrated folder,* the various "Improved Schlueter" Floor Surfacing Machines.

FLOOR VOIDS FOR USE IN CONCRETE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
67. *Loose-leaf Bulletins.* 8½ x 11. Pyrobar Gypsum Floor Tile.

FURNACES—See Heating Equipment

GARAGE CONSTRUCTION

McKinney Mfg. Co., Pittsburgh, Pa.
283. *Interesting 16-page Catalog,* describing the complete hardware for various types of Garage Doors.

National Mfg. Co., Sterling, Ill.
248. Catalog of Garage Hardware.

GARBAGE DESTROYERS

Kerner Incinerator Company, 1027 Chestnut St., Milwaukee, Wis.
68. *The Sanitary Elimination of Household Waste.* M-3 Folder. Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. 4 x 9 in.

GARBAGE RECEIVERS

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

GLASS

American Window Glass Co., Pittsburg, Pa.
69. Send for circular describing different varieties of window glass and how to select the proper kind.

American Three-Way Luxfer Prism Co., Cicero (Chicago), Ill.
70. Write for details and prices of glass prisms that will project daylight into dark interiors.
71. Other literature with reference to apartment house installations.

Plate Glass Mfgs. of America, 1st Nat'l Bank Bldg., Pittsburgh, Pa.
443. *Several folders,* describing the necessity of Plate Glass.

GYPSUM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

HARDWARE

Bridgeport Chain Co., Bridgeport, Conn.
444. *Catalog No. 14.* A 68-page illustrated book, describing an extensive line of chains, stampings and wire.

Caldwell Mfg. Co., 5 Jones Street, Rochester, N. Y.
445. *Sixteen-page illustrated catalog,* entitled "Suggestions for the Present-Day Architect."

Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.
446. *Illustrated catalog and price list* of "Casement Window Specialties."

Griffin Mfg. Co., Erie, Pa.
447. *Seventy-six page illustroted book,* cloth bound, entitled "Hinges."

Hess Warming & Ventilating Co., 1204 Tacoma Bldg., Chicago, Ill.
240. *24-Page Illustrated Catalog.* 4 x 6 in. Describing the Sanitary Medicine Cabinet, Lockers and Lavatory Mirrors.

H. B. Ives Co., New Haven, Conn.
448. *Write for their illustrated folder,* describing hardware, window and door specialties.

The Kawneer Co., Niles, Mich.
72. *Kowneer. Simplex Window Fixtures.* Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½ x 10¾ in. 16 pp.

Knape & Vogt Mfg. Co., Grand Rapids, Mich.
73. Garment Hangers. Send for illustrated booklet.

McKinney Mfg. Co., Pittsburgh, Pa.
449. *McKinney's "Complete Garage Sets,"* an interesting illustrated eight-page folder.

F. E. Myers & Bro. Co., Ashland, Ohio.
450. *Catalog,* describing the No. 30 Simplex Garage Door Hanger.

National Mfg. Co., Sterling, Ill.
451. *An interesting illustrated catalog* on "Garage Hardware."

Richards-Wilcox Mfg. Co., Aurora, Ill.
75. *Modern Hardware for Your Home.* Catalog of hangers for varnishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Sidetite" garage door hardware. 24 pp. Illustrated. 8½ x 11 in.

Sargent & Company, New Haven, Conn.
452. *Sixty-six-page illustrated booklet* on "Planes."
453. *Thirty-six-page illustrated booklet* on "Standard Steel Squares."

The Stanley Works, New Britain, Conn.
76. *Wrought Hardware.* New 1921 Catalog. This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 676 pp. Illustrated. 6¼ x 9½ in.
77. *Garage Hardware.* Booket, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustration and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.
78. *Eight Garages and Their Stanley Hardware.* Booklet. Plans, drawings and complete hardware specifications. Size 5 x 7 in.
79. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in.

HEATING EQUIPMENT

Bowman Supply & Mfg. Co., 886 Progress, Pittsburgh, Pa.
513. Write for the permanent catalog. It is an excellent reference book.

Co-operative Foundry Co., Rochester, N. Y.
454. *Sixteen-page illustrated booklet,* describing the "Red Cross Empire Pipeless Furnace."

Economy Heater Co., 108 S. La Salle St., Chicago, Ill.

The Farquhar Furnace Company, Wilmington, Ohio.
80. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Illustrated. 4¾ x 9¼ in.
81. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating and layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Illustrated. 8½ x 11 in.

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.
455. *Handy-Man Book,* or Plumbing and Heating Encyclopedia. Price 50c.

Hess Warming & Ventilating Co., 1205D, Tacoma Building, Chicago, Ill.
82. *Modern Furnace Heating.* Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.

B. Karol & Sons Co., 802 So. Kedzie Avenue, Chicago, Ill.

Kelsey Heating Company, James Street, Syracuse, N. Y.
83. *Booklet No. 5.* 4 x 9. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.
84. *Monroe Pipeless Booklet.* 4½ x 8 in. 20 pp. Illustrated.
85. *Monroe Tubular Heater.* Booklet. 4¼ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
86. *Syracuse Pipeless Booklet.* 4½ x 8 in. 12 pp. Illustrated. General Booklet giving sizes and capacities.
87. *Valves, Syphons and Traps.* A series of pamphlets to enclose in envelopes, describing the well known Thermostatic Return Line Valves and other heating equipment specialties made by this company.

Magee Furnace Co., Boston, Mass.

Strait & Richards, Inc., Newark, N. J.
88. *Catalog* describing fireplaces, electric and gas logs, heaters, etc.

Eighty-six Cement Manufacturers Unite to Serve You

The Portland Cement Association means this: that valuable scientific, advisory and educational work which no one cement manufacturer could reasonably undertake alone is at your disposal. This means that you can be absolutely sure of yourself in using Concrete.

You can be sure in the first place of the cement you buy. Any manufacturer of Portland cement may join the Association, and no manufacturer has to belong to it. But Association By-Laws require that members' products shall measure up to the high standard of specifications of the United States Government and the American Society for Testing Materials. Cement bought from a member of the Association is therefore dependable.

You can be equally sure of the way to use it. If you want information about its usefulness under certain conditions, or about how to mix it or place it to get the best results most economically, you can get it from any one of our 24 offices, one of which is near you.

Supplying dependable information without charge, by booklet, or by personal correspondence or by conference when necessary, is the work of the Association. To supply it authoritatively, the Association maintains a large research laboratory and a staff of more than two hundred engineers.

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Suggestions as to how our work may be made more useful to you are invited.

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to Improve and Extend the Uses of Concrete

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Chicago	Helena	Milwaukee	Pittsburgh	St. Louis
El Paso	Indianapolis	Minneapolis	Portland, Oreg.	Vancouver, B. C.
Denver	Kansas City	New York	Salt Lake City	Washington, D. C.

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 76*

HINGES

McKinney Mfg. Co., Pittsburgh, Pa.
456. *Complete Garage Sets* for all types of hinges. An interesting 8 page folder.

HOISTS—See Elevators

American Saw Mill Machinery Co., Hackettstown, N. J.
89. *Bulletin No.* 10 describing several kinds of builders' hoists.

C., H., and E. Mfg. Co., Milwaukee, Wis.
90. *Bulletin No.* 3. Hoists and Mortar Mixers.

HOLLOW TILE

Fiske & Company, Boston, Mass.
457. *Sixteen-page illustrated booklet,* entitled "Through the Home of Tapestry Brick"
458. *Sixteen-page illustrated booklet,* entitled "Tapestry Brick and Tile Work for Floors and Interior Walls."

Hollow Building Tile Association, Chicago, Ill.
459. *Write* for the "Handbook of Hollow Building Tile Construction." This is an interesting and helpful book.
460. *Seventy-page book,* called "Hollow Building Tile Manual for Builders and Masons," is of vast importanee.

National Fire Proofing Co., Pittsburgh, Pa.
461. *Several interesting booklets can be procured,* namely: "Natco on the Farm," "Natco Grain Bins, Corn Cribs and Storage Bins," "Fire Proof Buildings of Natco Hollow Tile," "Bulletin No. 171, Standard Fire Proofing."

HOUSE MOVING

La Plante Choate Co., Cedar Rapids, Iowa.
510. *Descriptive Catalog of House-moving Appliances.*

INCINERATORS—See Garbage Destroyers

INSULATION

Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
92. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bisphopric Stucco-Board and Bishopric Sheathing Board.

Samuel Cabot, Inc., 141 Milk St., Boston, Mass.
249. Cabot's Quilt. Catalog containing drawings and description.

U. S. Mineral Wool Co., 280 Madison Avenue, New York, N. Y.
94 *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼ x 6¾ in.

JOISTS AND STUDS, PRESSED STEEL

General Fireproofing Co., Youngstown, Ohio.
462. *An interesting booklet,* called "Industrial Housing," has the actual blue prints in it.

Central Pressed Steel Co., Massillon, Ohio.
96. *Descriptive 4-page folder* on metal lumber for building construction.

Truscon Steel Company, Youngstown, Ohio.
95. *Truscon Steel Joists.* Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

KITCHEN EQUIPMENT

Bisk Corp., Brockton, Mass.
463. *Several interesting booklets,* describing the various types of "Built-In-Kitchens." These are illustrated by actual blue prints.

National Mill & Lumber Co., 2 Rector Street, New York.
277. 10-*Page Illustrated Folder.* Describes the necessity and advantages of a National Built-In Ironing Board.

LATH, METAL AND REINFORCING

The Bisphoric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.

Bostwick Steel Lath Co., Inc., Niles, Ohio.
279. *"Beautiful Permanent Walls."* 22-page illustrated catalog. 4 x 9 inches.

Central Pressed Steel Co., Massillon, Ohio.

General Fireproofing Co., Youngstown, Ohio.
97. *Catalog* describes Herringbone Rigid Metal Lath, how it is applied and used, with detailed drawings, specifications, etc.

Truscon Steel Co., Youngstown, Ohio.
99. *Hy-Rib and Metal Lath.* 18th Edition. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

LEVELS

A. S. Aloe Co., 513 Olive Street, St. Louis, Mo.

Eugene Dietzgen Co., 162 W. Monroe St., Chicago, Ill.

Keuffel & Esser Co., Hoboken, N. J.

Lufkin Rule Co., Saginaw, Mich.

Warren-Knight Company, 136 North 12th St., Philadelphia, Pa.
100. *"Sterling" Levels and Transits.* 32 pp. illustrated catalog. Description, specifications and structural advantages required in modern practice for establishing lines, levels, angles, etc. Vest Pocket Manual of adjustments.

David White Co., 907 Chestnut Street, Milwaukee, Wis.
464. *Catalog A,* "White's Improved Instruments," is a 36-page booklet with a hard cover and illustrated.

LIGHTING

American Three-Way Prism Co., 1307 South 55 Court, Cicero, Ill.
98. *Descriptive Circular* on the use of prisms for directing light to dark corners.

LIGHTNING RODS

E. G. Washburne Co., 207 Fulton Street, New York
232. *Descriptive Catalog in Colors.* Showing different designs of weather vanes, lightning rods, ventilators, etc.

LIGHTING SPECIALTIES

I. P. Frink, Inc., 24th Street and 10th Avenue, New York, N. Y.
250. *Lighting Service for Hospitals.* A booklet illustrated with photographs and drawings, showing the types of lights for use in hospitals, as operating table reflectors, linolite and multilite concentrators, ward reflectors, bed lights and miroscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses. Size 7 x 10 in. 12 pp.
251. *Frink Reflectors and Lighting Specialties for Stores.* Catalog No. 424. A catalog containing description of the Frink Lighting System for Stores; the Synthetic System of Window Illumination; and a number of appliances to produce the most effective lighting of displayed objects. 20 pp. Illustrated.
252. *Frink Lighting Service for Banks and Insurance Companies.* Reflectors. Catalog No. 425. A very interesting treatise on the lighting of offices; with details of illustrations and description of lamps and reflectors. Contains a list covering several pages, of banks using Frink Desk and Screen Fixtures. 30 pp. Illustrated. 8¼ x 11 in.

LUMBER

Arkansas Soft Pine Bureau, 802 Boyle Building, Little Rock, Ark.
101. *Arkansas Soft Pine Handbook.* Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Moulding Designs.
102. *The Home You Long For.* Booklet. 8½ x 11. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.

Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
104. *The Post Everlasting.* Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.
228. *Poles That Resist Decay.* Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.
105. *"From Tree to Trade,"* a 48-page illustrated description of the manufacture of lumber from tree to use. Describes methods of logging, construction, etc.

Pacific Lumber Company of Illinois, The, 1105 Lumber Exchange Building, Chicago, Ill.
106. *Engineering Digest.* Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipes, Outbuildings, Irrigation Flumes, Drainage Boxes, Greenhouses, etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.

Southern Cypress Mfrs. Assn., 1227 Poydras Bldg., New Orleans, La.
107. *Many interesting booklets* on the use of Cypress for all purposes.

LUMBER ASBESTOS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
108. *Ambler Asbestos Building Lumber.* Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½ x 11 in.

MARBLE, ARTIFICIAL

Art Stone Co., Wayneshoro, Pa.

METAL LATH—See Lath, Metal and Reinforcing

METALS AND METAL BUILDING SPECIALTIES

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.
111. *Reference book. Pocket Edition.* 2½ x 4½ in. 168 pp. Illus. Covers the complete line of Sheet and Tin Mill Products.
113. *Apollo and Apollo-Keystone Galvanized Sheets.* Catalog. 8½ x 11 in. 20 pp. Illustrated.
114. *Research in the Corrosion Resistance of Copper Steel.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.
115. *Facts Simply and Briefly Told.* Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.
116. *Black Sheets and Special Sheets.* Catalog, 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, building tables, etc. Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

The Donley Bros. Co. 7400 East 74th Street, Cleveland, Ohio.
237. 28-*Page Illustrated Catalog* on "Donley Devices and Building Specialties" 6 x 9 in.

N. & G. Taylor Co., Philadelphia, Pa.
117. *Booklet and Detail Sheet of Tin Roofing.* See Roofing.

METAL TRIM—See Doors, Windows and Metal

MILLWORK—See also Lumber—Building Construction—Doors and Windows

MORTAR—See also Cement

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.
118. *Clinton Mortar Colors.* Booklet. 3½ x 6¾ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

PACKAGE RECEIVER

The Donley Bros., 3700 East 74th Street, Cleveland, Ohio.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Samuel Cabot, Inc., Mfg. Chemists, 141 Milk Street, Boston, Mass.

S. C. Johnson & Son, Racine, Wis.
122. *The Proper Treatment for Floors, Woodwork and Furniture.* Booklet. 6¼ x 8¾ in. 32 pp. Illustrated in color. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.
123. *Portfolio of Wood Panels.* 5½ x 10¾ in. 14 pp. Containing actual panels of finished woods. Also contains valuable information of finishing and re-finishng floors and woodwork.



Roof stained with Cabot's Creosote Stains. Walls finished with Old Virginia White. Lined with Cabot's Quilt for warmth.
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For Roofs, Siding, Timbers and all Other Outside Woodwork

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They have proved their merit in every climate for nearly forty years. The colors are soft, rich and harmonious; the Creosote penetrates the wood, preserves it, and makes it less inflammable. Shingles make the warmest and cheapest outside finish, and a shingled house stained with Cabot's Stains is the ideal, cozy American country home.

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A scientific heat insulator and sound-deadener that makes houses warmer in winter and cooler in summer and deadens sounds in floors and partitions. Not a mere felt or paper, but a non-conducting mat that is about thirty times warmer than common papers.

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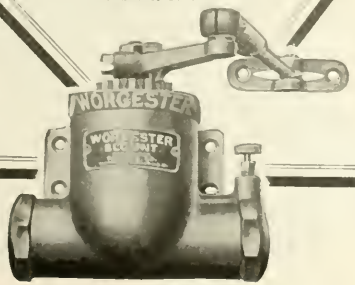
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For less than $100.00 additional the plaster-base of walls and ceilings of the average home (costing in the neighborhood of $5,000) can be Bostwick Truss-Loop throughout.

One thousand wood lath equals 60 sq. yds. of wall surface and costs $12.00. This varies slightly in different localities. Wood lath, properly spaced, takes almost exactly the same amount of plaster as Bostwick Truss-Loop. Truss-Loop, therefore, costs only the margin between first cost of wood lath and first cost of Truss-Loop. This works out to from $65.00 to $100.00 more for the usual types of moderate-priced homes. Just this small margin secures lasting wall beauty and fire-protection.

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LATH COMPANY
Niles, Ohio

Bostwick "TRUSS LOOP"



SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 78*

John Lucas & Co., Inc., Philadelphia, Pa.
264. 100-*Page "Descriptive Catalog."* 6 x 9 in. Published for the purpose of familiarizing "Lucas" distributors with the characteristics, purposes and uses of "Lucas Paints and Varnishes."

National Lead Co., 111 Broadway, New York City.
124. Handy Book on Painting. Book 5½ x 3¾ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal, etc., both interior and exterior.

Ripolin Co., The, Cleveland, Ohio.
256. *Ripolin Specification Book.* 8 x 10¼ in., 12 pp. Complete architectural specifications and general instructions for the application of Ripolin, the original Holland Enamel Paint. Directions for the proper finishing of wood, metal, plaster, concrete, brick and other surfaces, both interior and exterior, are included in this Specification Book.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
131. *Spread the Sunshine Inside.* Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories.

PARTITION SYSTEM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
133. *Loose leaf bulletins,* 8½ x 11 in. Jester-Sackett, consists of plaster board applied to metal channels with special clip, ready for plastering.

PARTITION TILE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
134. *Fireproof.* 32-page booklet, 8½ x 11 in., including description, specifications, and working details of Pyrobar partition tile.

PERGOLAS

Hartmon-Sanders Co., Elston and Webster Avenues, Chicago, Ill.
235. *Album No. 33.* 7½ x 10½ in. 42 pages of illustrated literature regarding the various types of Pergolas.

PLASTER BASE

The Bishopric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.

PLASTER BOARD

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
135. *Pamphlets,* describes Sackett Plaster Board used instead of wood or metal lath.

PLASTER INTERIOR

National Kellastone Co., 155 East Superior Street, Chicago, Ill.

PLUMBING SUPPLIES

Bowman Mfg. Co., 886 Progress Street, Pittsburgh, Pa.
512. Leather bound, profusely illustrated catalog of 84 pages describing the entire line of plumbing and heating equipment.

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

Hess Warming & Ventilating Co., 1205D Tacoma Bldg., Chicago, Ill.
136. *Hess Sanitary Steel Medicine Cabinets.* Booklet, 4 x 6 in.

B. Karol & Sons Co., 806 So. Kedzie Avenue, Chicago, Ill.
465. *Write for Catalog K,* describing the complete line of Plumbing and Heating Supplies.

PUMPS

C. H. & E. Mfg. Co., Milwaukee, Wis.
251. Bulletin No. 2 Pumps.

The F. E. Myers & Bro. Co., Ashland, Ohio.
137. *General Catalog.* 6 x 9 in. 392 pages. Shows complete line of Myers Products—Pumps for Every Purpose, Hay Tools, Door Hangers, Store Ladders, etc. Of particular interest to hardware and implement dealers; plumbers, architects, contractors and builders; mill, mine, factory and railway superintendents and purchasing agents; highway contractors and builders.
138. *Catalogs.* 6 x 9 in. Devoted to separate lines: No. 55, Pump—Hand and Power Pumps; No. PP-55, Power Pumps; No. HT-55, Hay Tools, Door Hangers and Store Ladders; No. HP-22, Hydro-Pneumatic Pumps, Electric House Pumps, Direct Water Systems; No. SOP-21, Self-Oiling Power Pumps; No. MC-21, Cylinder and Working Barrels; No. SP-22, Spray Pumps and Spraying Accessories. All catalogs fully illustrated.

REFRIGERATION

McCray Refrigerator Co., 2264 Lake Street, Kendallville, Ind.
466. *Catalog No. 95*—Refrigerators for Residences.
467. *Catalog No. 53*—Refrigerators for Hotels, Restaurants, Clubs.
468. *Hospitals and Institutions.* Catalog No. 64—Market Coolers and Refrigerator Counters.

ROOF DECKS

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
139. *Loose leaf bulletins.* 8½ x 11. Describing Pyrobar Roof Tile, which is laid directly on purlins or tee irons, joints grouted, and is then ready for roof covering.

ROOFING MATERIALS

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.

American Sheet & Tin Plate Company, Pittsburgh, Pa.
140. *"Better Buildings."* Catalog. 8½ x 11 in. 32 pp. Describing Corrugated and Formed Sheet Steel Roofing and Siding Products—Black, Painted and Galvanized; together with directions for application of various patterns of Sheet Steel Roofing in various types of construction.
112. *Copper—Its Effect Upon Steel for Roofing Tin.* Catalog 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
141. *Specifications and Price List.* Descriptive booklet. Details of Ambler Asbestos Cement Roofing Slates, "Century" Asbestos Shingles and Asbestos Corrugated Sheathings. Tables and drawings. Size 6 x 9 in. 44 pp.
142. *Ambler Asbestos Corrugated Roofing.* Catalog gives complete data for specifying, drawings, methods of applications, tables, etc. Size 8½ x 11 in. 20 pp.

Wm. L. Barrell Co. of N. Y., Inc., 50 Leonard Street, New York.
143. *Prepared Canvas for Roofing.* Samples can be obtained on application. A canvas for every use.

Beaver Board Products Co., Inc., Buffalo, N. Y
469. *Illustrated catalog* will be sent on request.

Blue Ridge Slate Corp, Esmont, Va.
470. *Samples and catalogs* sent on request.

John Boyle & Co., Inc., 112-114 Duane Street, New York, N. Y.
154. *Boyle's Bayonne Roof and Deck Cloth.* List B 93. A prepared roofing canvas guaranteed waterproof for decks and the roofs and floors of piazzas, sun-parlors, sleeping porches, etc.

Copper & Brass Research Association, 25 Broadway, N. Y. City.
267. *"How to Build a Better Home."* 36-page illustrated catalog. 8 x 10½ in. This not only describes but teaches the prospective buyer the essential facts of building, finance, hardware and roofing.
34. *"Copper Roofing,"* a manual for architects and builders. Weights of various roofing materials. Up-to-date practise in the laying of copper roofs—Batten or wood rib methods, Standing seam method, Flat copper roofs, Copper shingles, Suggestions for avoiding error and obtaining the full value of copper. Decorative effects and how to obtain them. Flashings, reglets, gutters and leaders. Cornices. Copper-covered walls. Specifications. 32 pp. Ill. 8½ x 11.

Cortright Metal Roofing Co., Philadelphia, Pa.
236. Four-page circular describing the various shingles.

Creo-Dipt Company, 1025 Oliver Street, North Tonawanda, N. Y.
153. *Standard Stained Shingle.* Samples of different kinds mailed.
154. *Architectural Service Sheets.* 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.

Edward's Mfg. Co., 423 Eggleston Avenue, Cincinnati, Ohio.
471. *Catalog No. 65* describes fully Metal Roofing, Siding, Ornamental Ceilings and other Sheet Metal Work. This is a 210-p. catalog well illustrated.

C. G. Hussey & Co., Pittsburgh, Pa.
227. *Copper Roofing and Flashings.* Book No. 6. 34 pp.

Illinois Zinc Company, 280 Broadway, New York, N. Y.
155. *"Ixco," the Metal of Permanence."* 8-page, illustrated booklet describing the durability, service and maintenance cost of Corrugated Sheets of Pure Rolled Zinc.
156. *The Roof That's Always New.* Booklet. 3¾ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley ridge and hip piece.

National Sheet Metal Roofing Co., 339 GrandSt., Jersey City, N. J.
159. *Manufacturers of Metal Shingles* in various designs, both in painted tin or galvanized iron. Samples sent on request.

Richardson Co., Lockland, Cincinnati, Ohio.
472. *Four-page folder,* describing the Flex-A-Tile Roll Shingle Roofing.

F. C. Sheldon Slate Co., Granville, N. Y.
473. *Sixteen-page colored catalog,* describing the "Most Attractive Roof at the Most Reasonable Cost."

N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.
160. *Selling Arguments for Tin Roofing.* Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
161. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins. 8½ x 11. Pyrofill.

Vendor Slate Co., Easton, Pa.
474. *"A Book for Architects"* is the title of the new 24-page well-illustrated catalog.

Vulcanite Roofing Co., Buffalo, N. Y.
475. *Interesting booklets,* describing the "Better Shingle" and "Vulcanite Roll Roofings."

RULES

A. S. Aloe, St. Louis, Mo.

Eugene Dietzgen Co., 162 Ft. Monroe Street, Chicago, Ill.
476. *Write for an instructive circular.*

Keuffel & Esser, Hoboken, N. J.

Lufkin Rule Co., Saginaw, Mich.

Sargent & Co., New Haven, Conn.

Stanley Rule & Level Co., New Britain, Conn.

SASH CHAINS, HOOKS AND ATTACHMENTS

The Bridgeport Chain Co., Bridgeport, Conn.
209. *An interesting catalog* describing fully Sash Chain in Steel (six sizes and six finishes), in Bronze (six sizes), Hooks and Sash Chain Attachments.

SASH CORD

Samson Cordage Works, Boston, Mass.
477. *An interesting catalog* with actual samples of the various grades of cordage therein.

SAW MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.
162. *Catalog No. 21,* describing Circular Saws of all sizes.
163. *General Catalog No. 22* and *special Bulletin No. 77,* describing sawing machinery for use on the job in the shop.

W. F. & John Barnes Co., 71 Ruddy Street, Rockford, Ill.
478. *Catalog No. 84* describes in full detail the Patent Foot and Hand Power Wood Working Machinery.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
164. *Bulletin No. 1, Saw Rigs.*

Crescent Machine Co., 206 Main Street, Leetonia, Ohio.
479. *This* 1921 *catalog* contains improvements on No. 3 and No. 5 Saw Tables No. 2 Motor-Driven Saw Table, New Motor-Driven Sharper, Hollow Chisel Mortiser.

Huther Bros. Saw Mfg. Co., Rochester, N. Y.
480. *Catalog No. 38* describes the complete line of Saws.

C. E. Jennings Co., 321 Winthrop Avenue, New Haven, Conn.
481. *An interesting* 46-page Tool Chest Catalog may be had on request.

How You Can Make Big Money Out of What Other Men Learned

Every day in your work you get up against new problems—sometimes it's only some old "sticker" coming in a new way. Just the same, though, it takes a lot of time to figure it out. *Don't do it.* That's where you lose out—doing work that someone else has already done for you. Here's everything worked out for you by twenty-five of the world's greatest building experts. Every problem, big or little, that you will meet in a day's work is explained. Here are hundreds of new ideas and better ways of doing things. Hundreds of ways that other men are making more money. Hundreds of ways you can make more money out of the same work you are doing now.

Over 200,000 men in various lines of industry have made good and are earning more money because of what they have learned from the A. T. S. Books. Hundreds are making good every day. What other men have done, YOU can do too.

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Carpentry (including everything from the raw timber and tools to the trimming and turning over to owner) — Stair Building — Steel Square—Plastering and Painting—Mechanical Drawing—Blue Print Reading—Architectural Drawing — Sheet Metal Work—Building Superintendence—Underwriters' Requirements — Heating and Ventilating—Steam and Hot Water Fitting—Sanitary Appliances—Water Supply—Drainage and Venting—Domestic Hot Water Supply—Hardware—Estimating—Contracts and Specifications—Legal Relations—Building Code—General Index and Review Questions and Index to each volume.

Everything About Every Kind of Building

Five great books, flexibly bound in handy volume style, with 2,140 pages and more than 1000 blueprints, pictures, plates, plans and diagrams. These books are not a one man proposition but the combined work of twenty-five well known experts who gathered their material from thousands of different sources. Every carpenter, every apprentice, every contractor, in fact every man who has anything to do with building, or who is interested in building in any way should have a set handy to study up with, or to use for quick reference when he is in doubt about something.



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SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 80*

Parks Ball Bearing Machine Co., Station A, Cincinnati, Ohio.
482 *Catalog B* describes in detail Wood Working Machines.
Sidney Machine Tool Co., Sidney, Ohio.
483. *Twelve-page illustrated booklet,* describing the "Famous Universal Wood Workers."
484. *One hundred-page pocket-size catalog,* giving full information on the "Famous Woodworking Machinery."

SAWS
E. C. Atkins Co., Indianapolis, Ind.
286. Booklet and chart describing saws. Especially the cross cut saw.

SCREENS
American Wire Fabrics Company, 208 So. La Salle St., Chicago, Ill.
165. *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enamel, galvanized, galvanoid, American bronze. 30 pp. Illustrated. 3½ x 6¼ in.

SHEATHING
Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
171. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.
U. S. Gypsum Company, 205 West Monroe St., Chicago, Ill.
173. *Eight-page Folder.* Describes Adamant Sheathing Board for use instead of wood sheathing.

SHINGLES—ASPHALT
Winthrop Tapered Asphalt Shingles, 19 So. La Salle St., Dept. No. D-20. Chicago, Ill.

SHINGLES—METAL
Cortright Metal Roofing Co., 50 North 23rd St., Philadelphia, Pa.
174. *"Concerning That Roof."* A complete catalog describing and illustrating Cortright Metal Shingles and Trimmings. 7 x 10¼ in. 32 pp.

SHOWERS, CURTAINLESS
Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.
260. *4-page File and Reference Sheet* describing six different models of the shower.

SLATE—See also Roofing
Blue Ridge Slate Corp., Esmont, Va.
Knickerbocker Slate Corp., 153 East 38th Street, New York, N. Y.
485. *Four-page folder,* describing the "Graduated Slate Roofs."
F. C. Sheldon Slate Co., Granville, N. Y.
175. *Commercial and Architectural Roofing Slate* in all colors and textures. Also blackboards, structural and electrical slate. Slate Granules.
Vendor Slate Co., Easton, Pa.

STAIRWAYS
Bessler Movable Stairway Co., Akron, Ohio.
169. *Illustrated catalog,* containing 24 pp., describes how the Bessler Movable Stairway saves floor space and adds an extra convenience to the home.

STANDARD BUILDINGS
Truscon Steel Co., Youngstown, Ohio.
176. *Truscon Standard Buildings.* Fourth Edition. Catalog. 8½ x 11 in. 40 pp. Illustrated. Erection details, cross-section diagrams and adaptations are given.

STONE, BUILDING
Art Stone Co., Waynesboro, Pa.
170. *Descriptive circulars with illustrations* of different marbles in colors. Sent free to any interested party.

STORE FRONTS
J. W. Coulson Co., Columbus, Ohio.
278. Store Front Construction simplifies the problem for the builder and owner. It beautifies and enhances the value of store property. A special device prevents glass breaking.
Detroit Show Case Co., 1660 W. Fort Street, Detroit, Mich.
486. *Write for* "Full Size Details of Desco Metal Store Front Construction." This illustrates by means of blue prints the various store fronts.
Kawneer Co., Niles, Mich.
177. *Kawneer Store Front.* Illustrated catalog. Drawings and details of construction. Size 8½ x 11 in. 32 pp.
178. *Full Size Details Kawneer Construction.* Blue prints. Size 30 x 30 in.
179. *A Collection of Successful Designs.* Portfolio. Shows 24 typical store fronts with elevations. Size 9 x 12 in. 32 pp.
Catalog R-1, 8 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STRUCTURAL STEEL
Central Pressed Steel Co., Massillon, Ohio.

STUCCO—See also Cement
American Materials Co., 101 Park Avenue, New York, N. Y.
487. *A 32-page illustrated catalog,* describing "Elastica," the Stucco of Permanent Beauty.
The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.
182. *The Stucco House.* Contains many beautiful illustrations of houses finished with stucco and selected particularly for their architectural value. Detailed illustrations of stucco surface, textures and drawings showing wall construction with revised specifications covering application of stucco. 96 pp. 8½ x 11 in. Price 50 cents.
180. *Guide to Good Stucco.* A book telling of the advantages of Portland Cement stucco, and how to apply it. Shows numerous finishes obtainable with ATLAS WHITE Portland Cement. 28 pages. 8½ x 11 in.
The Bishopric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.
Muller, Franklyn R. Co., Waukegan, Ill.
National Kellastone Company, 155 E. Superior St., Chicago, Ill.
183. *Specifications for Stucco Work.* A booklet containing complete specifications in detail for the use of Kellastone stucco for new buildings as well as the "overcoating" of old buildings. 13 sheets of text, 2 sheets of illustrations. 8 x 11 in.
184. *The Story of Kellastone Imperishable Stucco.* In this most interesting book the merits of Kellastone are set forth in a convincing manner. Every page contains pictures of beautiful houses stuccoed with Kellastone, and there are two pages in color. 22 pp. Illustrated. 8½ x 12 in.
Rochond Co., Van Wert, Ohio.
268. *"Fortifies Your Home Against the Elements and Time."* 16-page folder. 3½ x 6 in.
269. *"Better Homes."* 12-page booklet, 7¾ x 8 in., describing the advantages of "Rochond."

STUCCO BASES
Bishopric Manufacturing Co., 103 Este Avenue, Cincinnati, Ohio.
181. *Bishopric for All Time and Clime.* Catalog. 7½ x 11 in. 52 pp. Illustrated. Describing the use of Bishopric Stucco and Plaster Base and Bishopric Sheathing.

STUCCO-MAGNESITE—See Stucco
American Materials Company, 101 Park Avenue, New York, N. Y.; Weed Street and Sheffield Avenue, Chicago, Ill.
185. *Elastica, the Stucco of Permanent Beauty.* Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.
Natl. Kellastone Co., 155 East Superior St., Chicago, Ill.
488. *An interesting handbook,* telling the story of "Kellastone."
489. *Catalog No. 100,* giving the specifications for Stucco Work.
United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

SURVEYORS' INSTRUMENTS—See Levels

SUSPENDED CEILING
U. S. Gypsum Company, 205 West Monroe Street, Chicago, Ill.
186. *Loose-leaf Bulletins.* 8½ x 11. Jester-Saskett, consists of plaster board applied to metal channels with special clip, ready for plastering.

THERMOSTATS—See Heating Equipment

TILE, HOLLOW
Hollow Building Tile Association, Dept. 1812, Conway Building, Chicago, Ill.
187. *Handbook of Hollow Building Tile Construction.* 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.
National Fire Proofing Co., 250 Federal Street, Pittsburgh, Pa.
188. *Standard Wall Construction Bulletin 174.* 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.
189. *Industrial Housing Bulletin 172.* 8½ x 11 in. Illustrated. Photographs and floor plans of typical workingmen's homes.
190. *Notes on the Farm.* 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.

TIMBER CLAMP
Schenck Timber Clamp Co., 501 Fifth Avenue, New York City.
490. *Several interesting descriptive folders* may be had on request.

TOILET PARTITIONS—STEEL
Hart & Hutchinson, New Britain, Conn.
284. Write for this Catalog, describing the sanitary and durable usages of these partitions.

TOOLS
Mack Tool Co., Rochester, N. Y.
491. *An interesting Carpenter's Catalog* may be had on request.
492. *"Loose Stories,"* a lively booklet, bound to be pleasant and worth while reading.
Progressive Mfg. Co., Torrington, Conn.
493 *Twelve-page booklet,* describing the "Forstner Bits."
Sargent & Co., New Haven, Conn.
Stanley Works, New Britain, Conn.
494. *A 64-page catalog,* describing "Bronze and Steel Butts," by detailed drawings.
495. *An essential catalog* of 380 pages, giving the entire line of Wrought Hardware.
James Swan & Co., Seymour, Conn.
496. *An interesting 104-page catalog,* describing "Premium Mechanics' Tools."
The L. & I. J. White Co., Buffalo, N. Y.
497. *Catalog No. 19A* describes Carpenters' Tools.
498. *Catalog No. 20B* describes Coopers' Tools.

TRACTORS
C. H. & E. Mfg. Co., Milwaukee, Wis.
275. Bulletin No. 4, Tractors.

TRANSITS (See Levels)
Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.

TRUSS LOOPS
The Bostwick Steel Lath Co., Niles, Ohio.
279. *"Beautiful Permanent Walls,"* 22-page illustrated catalog.

VENTILATION
Danzer Metal Products, Hagerstown, Md.
Royal Ventilator Company, 415 Locust Street, Philadelphia, Pa.
193. *Descriptive Catalog* of round and rectangular ventilators made in galvanized iron, copper, etc. Illustrated.
E. G. Washburne Co., 207 Fulton Street, New York, N. Y.
194. *Illustrated Booklet* of metal ventilators, weather vanes, lightning rods, etc.

WALL BOARDS
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
195. *Descriptive catalog and sample of Linabestos Wall Board* for interior construction. Flame-proof and fire-resisting wall board.

BUILDING AGE
AND
THE BUILDERS' JOURNAL
NEW YORK, DECEMBER, 1922

Creating a Desire *for* Better Building *by* Erecting Model Homes

EARNEST efforts are being made by various groups of builders and different organizations to have better homes, both in design and construction. A rather interesting effort along this line was recently successfully completed at Larchmont Gardens, N. Y. A "Model Home" was erected and this was completed by noon on October 9th and thrown open for public inspection. From October 9th to 15th was "Better Homes Week" in New York, and that is why October 9th was selected for the opening date.

The building industry is receiving a good deal of publicity in various newspapers, magazines, books, etc., all tending to educate the public for the better things for buildings that can be had. More attention is now being paid to conveniences, rather than to mere size and this results in more comfort at less expense.

Sometime ago a design of a house was published in the New York "Tribune" which was furnished by the Home Owners' Serv-





ice Institute, of New York, having been designed by John Floyd Yewell, architect. The thought then occurred that to build a house as a demonstration of what could be done and keep accurate records of the cost would be something practical and would create quite a good deal of interest amongst intending home owners. Therefore, with the added co-operation of the Empire Home Building Association, of New York, as builders, the project was started, and brought to a successful finish, as evidenced in these pictures.

The actual construction of the model house was begun at Larchmont Gardens, New York, on August 1, and on October 11 it was completed in every detail within and without and was ready for immediate occupancy. The house cost complete $8,842.06, including the builder's profit. The various items entering into this amount are given in a separate table in detail form. The cost of the land and the landscaping brought the total cost to $11,896.32.

For the above amount this model home represented high standards of construction and was what its builders intended that it should be —a home of trimness and stability. It is the proof of its sponsors that the Larchmont Gardens House is as near to perfect as could be obtained for the American small home of today. This house is located at the corner of Harmon Drive and Weaver Street, Larchmont Gardens, New York, within forty minutes' ride of the Grand Central Station in New York.

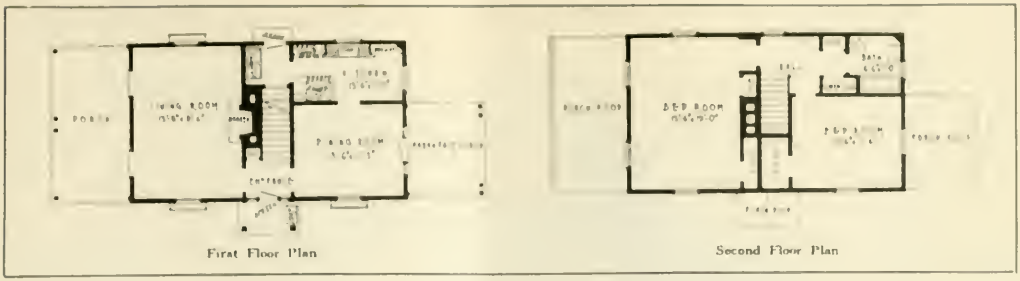
The design selected won first prize in the recent National Small House Competition. It was also selected by the National Lumber Manufacturers' Association for exposition in model form at different expositions.

The plan of the model house as given here includes living room, dining room and kitchen on the first floor and two porches, besides the entry porch. The smaller porch off the dining room can be used as an outside dining room. A convenient arrangement is having the laundry tubs in the back entry. There are two bedrooms of good size on the second floor, together with bathroom and ample closet room.

We give in this article several views of the interior, showing the living room, dining room, and one bedroom. The house is 20 ft. x 34 ft. 6 in., not including the porches. As built, the cubical contents is 20,322 cu. ft. The architect estimated the cost of construction at $8,000, and the actual figures come very close to this, which proves the correctness of the estimate.

The house was furnished by several prominent house furnishing establishments of New York. In the actual construction of the house, many well-known adver-





First Floor Plan

Second Floor Plan

SCHEDULE OF COST

		Per Cent.
Cellar Excavation, Masonry, Including Fireplace Lathing and Plastering	$2,330.00	29.0
Removing Two Trees	50.00	.6
Cesspool	100.00	1.2
Rough Lumber	1,046.03	13.0
Millwork	1,125.23	14.0
Carpenter Labor	1,268.69	15.8
Flex Stone Asbestos Shingles for Roof	110.00	1.3
Exterior and Interior Painting	450.00	5.6
Plumbing	711.00	8.9
Heating (Pipe Furnace)	270.00	3.5
Copper Gutters, Leaders, etc	165.00	2.0
Finish Hardware	67.25	.8
Tiling in Bathroom Floor and Wainscot	102.00	1.2
Electrical Work—Wiring and Fixtures	190.00	1.2
Murphy In-A-Dor Bed	62.13	.7
TOTAL	$8,047.33	100.0
CONTRACTOR'S PROFIT—10%	804.73	
TOTAL INCLUDING CONTRACTOR'S PROFIT	$8,852.06	
COST per square foot .92 Square Feet)	$11.63	
COST per cubic foot (30,311 Cubic Feet)	39.6c.	

tised building materials were used in its erection and equipment, but everything was bought at regular market price, so as to obtain actual average costs.

When the house was completed, advertisements in different papers called attention to it, and during the first 13 days that the house was open, more than 6,000 people visited it and on the final day of "Better Homes Week" 1,200 people were admitted. The verdict of the thousands who visited the house was that this interesting experiment in home building was a huge success.

The construction of the house was undertaken to determine the actual present-day building costs and conditions. Mere cheapness of construction was not sought. The thought uppermost in the minds of all co-operating was to obtain the best material at the best price and the whole-hearted co-operation of the various building crafts and dealers to obtain a really good job.

Of course, after the house has served its demonstration purpose it will be sold. Through the same parties co-operating again, the experiment will be repeated a number of times with various designs.

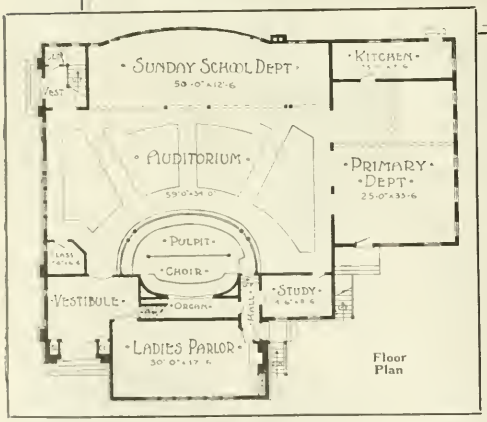
The idea of this educational campaign is to determine the variance in costs of different forms of construction and erected in different localities. By this means, it is believed that a great amount of actual first-hand information for the prospective home builder will be gathered. Of course, through the newspaper sponsoring this idea, detailed accounts of the progress of each house will be published, so as to keep the public interest keyed up. All this will tend to create the desire for better home building.



Attractive Design *for* Church

ARTHUR G. LINDLEY,
Architect

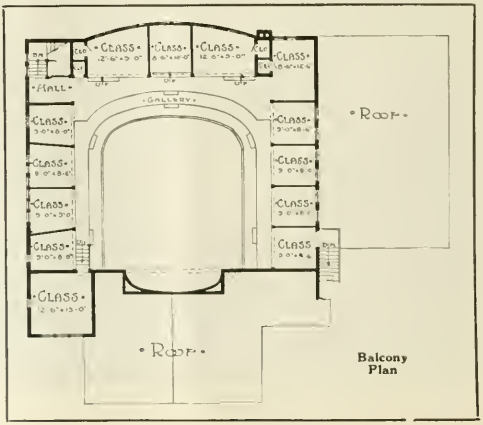




Floor Plan

OF quite popular style in exterior design the little church shown in the accompanying illustration shows distinctiveness in the paneled treatment of its outside walls, and possesses an interior arrangement that is exceptionally practical, commodious and convenient. It has a total seating capacity within view of the pulpit—in main auditorium, choir, gallery and Sunday School department—of about 450. In addition to these divisions, it possesses a large primary department, pastor's study, ladies' parlor, thirteen separate class rooms, and a well equipped kitchen.

The exterior finish consists of dark gray cement-stucco over brick up to the bottom of the first-floor windows and of light gray stucco over frame construction from this point upward. The interior is finished in Oregon pine woodwork throughout, which in all divisions, excepting the kitchen, is in old ivory enamel. The general effect is therefore particularly pleasing, and the light woodwork also naturally helps to make the interior bright and cheerful. The pews consist of opera chairs in natural birch, and the pulpit and choir furniture is selected to match the pews. The walls are plastered and tinted. The woodwork of the kitchen is in white enamel, and the walls here are white to correspond. All floors are of Oregon pine. This little church is located in Los Angeles, California, and is the home of the Pico Heights Methodist Episcopal Church.



Balcony Plan

Preventing Unnecessary Loss *of* Heat *by* Weatherproofing Houses

Some Suggestions That Builders Can Make When Customers Complain of Having a Cold House

BUILDERS are often called upon by people, especially those who have just bought a house, asking them what can be done, as the house is so cold and they seem to burn a whole lot of coal, more than seems necessary to heat such a small house, etc.

In nine cases out of ten, the builder finds on examination that the house is poorly constructed. The party who erected the house, built it as cheaply as possible. It looks like a real house from the outside and inside, but there is something lacking and that something is what somebody thought they could do without, as it seemed such unnecessary expense.

Good Construction Pays

If it is a home builder that is doing the complaining, he, of course realizes his mistake and regrets that he did not spend the small difference so as to get good construction. He is spending more than the difference in extra coal, vainly trying to obtain a little heat. The coal he burns is trying to heat.

The United States Department of Commerce, through its Division of Building and Housing, is sending out some useful suggestions that will do for builders to pass on to their customers when they are asked for advice of what to do for a cold house.

Consider Heat Saving

The saving of fuel was not seriously considered in the building of most houses. Many were shabbily built, and permit too much cold air to enter the house. Only a few years ago fuel was cheap and few bothered about saving it. While it is true that most attention should be given to the proper building of new houses, much can be done to prevent the loss of heat in poorly built and run-down houses. To save heat now not only helps to meet the present coal shortage, but it will teach those who plan to build new houses the value of weatherproofing and good construction. Our own comfort and that of our neighbors demands that we obtain the most heat from our coal without waste and that we try to reduce our requirements as much as possible.

Consider Ventilation

All houses should be well ventilated, but this does not mean that unregulated drafts of cold air should sweep through the house at all times. It should also be remembered that in cold weather the warm air is continually escaping, and as it passes through holes and cracks in the walls it is at once replaced by the cold out-of-doors air.

CRACKS around the windows and doors, broken window panes, and unprotected heating pipes indicate that fuel is being wasted. If one family wastes fuel during the coal shortage, another may suffer, for there is not enough coal to supply all with their usual amounts this winter.

The first duty of every one is to see what savings can be effected. Many suggestions appear from time to time as to how to save coal; some are excellent and can be followed easily and at little expense; while others may involve an expenditure which cannot be met. However, broken window panes should be replaced and the worst cracks around windows and doors closed up wherever possible for this cost is less than the cost of the extra coal that will otherwise be burned. Inability to pay for expensive improvements is no excuse for not making those which can be paid for out of the saving of fuel within the next year or two.

Direct Coal Saving

How much coal can be saved? If every family would save one ton of coal it would mean a saving of millions of dollars. During the present coal shortage the coal thus saved might be distributed among those who otherwise would be unable to obtain sufficient fuel, and perhaps keep many from suffering.

Millions of tons of coal can be saved this winter by the making of slight repairs on houses and the exercising of a little more care in burning coal.

Repair Your House

Some home owners have a reliable repair man look over their houses in the same way that they have the dentist look over their teeth. The owner can then decide what repairs can be undertaken. Much of the work he can do himself. The work he is able to pay for now can be done immediately.

In making an inspection the owner should examine the windows, doors, transoms and floors. He should also inspect the attic and the basement, examine the damper in the fireplace, and cracks under the baseboards. It might be well for him to start with the windows.

Windows

MUCH cold air comes in around windows or through them. Windows are often poorly fitted into the openings. Occasionally it is possible to see between the brick wall and the window casing. Window sash are rarely fitted snugly, and cold air enters freely around the sash. It is not uncommon to find a wide crack between the upper and lower sash. Such cracks can sometimes be closed by means of the sash lock. The use of weatherstripping will take care of most of the cracks around a window, and the saving of coal will be well worth while in a large number of houses.

It is well to go over all windows to see that putty is in place around the panes. A poor quality of putty is used in some of our houses, and where it has fallen off air enters around the glass.

That broken window pane in the basement should be replaced as promptly as if it were in the living room. Broken window panes in a

basement where heating and plumbing pipes are exposed waste fuel. The attic windows should also be examined.

In cold climates double or storm windows are very good to keep the house from getting cold. The air space between the two windows prevents the rapid passing of heat to the outside. Storm windows might be put over the windows on the side of the house facing the prevailing wind, even though they could not be afforded for all windows.

Doors

Doors are often poorly fitted, and air passes freely both above and below them. The crack below the door is often so large that cold air sweeps across the floor, keeping the room cold. A strip of cloth or felt nailed to the floor or to the door will keep out much of the cold. Hinges are not always well fitted into the door and frame, allowing much cold air to enter the house. This can be remedied by resetting the hinges. Transoms over doors should be examined, for they are not always snug fitting.

Storm doors involve some expense, but in many cases it is profitable to install one on the windward side of the house. It will prevent the inrush of cold air. The storm door, as well as the storm window, is used chiefly in the colder climate.

Floors and Baseboards

While double floors are becoming more common there are many houses in which a single floor is nailed direct to the joists. If tongue and groove flooring is used there is no draft, but there are floors with cracks between the boards. If there is no basement under this part of the house cold air will enter. Even though the floor be good, it does not give as much protection as a double floor.

In houses where there is no firestopping between the studs of the walls, cold air can pass freely from the attic to the basement. In such houses, if the plaster goes down only a little below the top of the baseboard, much air enters the rooms under the baseboards if they do not fit closely. Such cracks should be closed.

Basements

In some houses the warm air can pass from the basement upward between the studs. If such is the case it is advisable to close up the openings between the joists with old brick, or some other material. Basement doors and windows should be examined and made as tight as those in the rest of the house. Cold air entering the basement cools the heating pipes and furnace and the floor above.

The covering of the furnace and of steam and hot water heating pipes, especially in the basement, is advisable. Although insulation may be expensive it is well to consider the cost of fuel and saving that can be effected.

SOME important points to be considered to make a house weatherproof.

Good construction is essential.

Consider fuel saving when building.

Avoid cracks. Be sure to fill any around door and window openings.

Weatherstrips around doors and windows will save lots of heat.

Storm sash and storm doors aid a lot.

Joints should be tight between floor and baseboard.

Close up every possible opening between studs, etc.

Cover all heating pipes in exposed position.

Attics

Attics are usually cold and give plenty of chance for cold air to enter the house and for warm air to escape. Sometimes shingles are nailed direct to cleats and the out-door air enters between the cleats at the ends. Again free passage-ways for air in the walls, between the attic and the basement, keep this cold air in circulation. If the openings between the cleat ends are closed cold air may be kept out. The windows in the attic should receive as much attention as those in other parts of the house. Dead air in an attic keeps the lower stories warmer, while the direct opposite is the case with currents of air. The currents must be avoided, and this is accomplished if the house is properly firestopped.

Personal Attention

There are things that can be done to keep the house comfortable that do not cost money, but require some time and attention.

The locking of windows when closed, the drawing down of shades, the turning off of heat in an unused room or at night when windows are open, periodical care of heating equipment, all require a little time and thought, but will save heat. This means the saving of fuel for the nation, and lessened household expense. Special attention should be given to ventilation.

Thermometers are better gauges of heat than are the various members of a family, each with his own idea of warmth. Sixty-eight to seventy degrees is the normal healthful temperature for rooms in which people live.

To throw bed room windows wide open on cold nights and leave the heat turned on results in much waste of coal. It is often best to turn off the heat. Good ventilation is possible without large openings. In the rest of the house it often is advisable not only to close windows but also blinds and shades. Merely pulling down shades makes a material difference in the temperature of a room.

Chimneys, Stoves, Fireplaces, Etc.

Chimneys and stove pipes should be examined and cleaned out whenever necessary. Chimneys and stove pipes are intended to serve as flues, and the clogging of them affects the proper burning of the fuel. When fireplaces and stoves are not in use the dampers should be closed.

The same care should be given to the heating plant as to one's automobile. If the furnace or stove is out of order fuel will be wasted just as gasoline is wasted when the automobile is out of repair. If cracks are found in the furnace it needs prompt attention. A cracked or broken grate should be repaired or replaced.

Advice as to the most efficient and economical use of fuel in various types of heating plants can be obtained in many cases from the makers of the plants

There are few householders so situated that they can not save money by attention to weatherproofing and stopping heat losses. At the same time, they will be doing a good turn for their neighbors by saving fuel.

Charming Bungalow Design

Six Rooms of Large Size Conveniently Arranged



By CHARLES ALMA BYERS

THE little house shown above, built in southern California, represents a charming combination of the English-cottage and Belgian styles of domestic architecture, with certain modifying details that doubtless come largely from the California bungalow. As a result, it both presents an exterior that is unusually pleasing and attractive and possesses an interior that offers the maximum of convenience and livability.

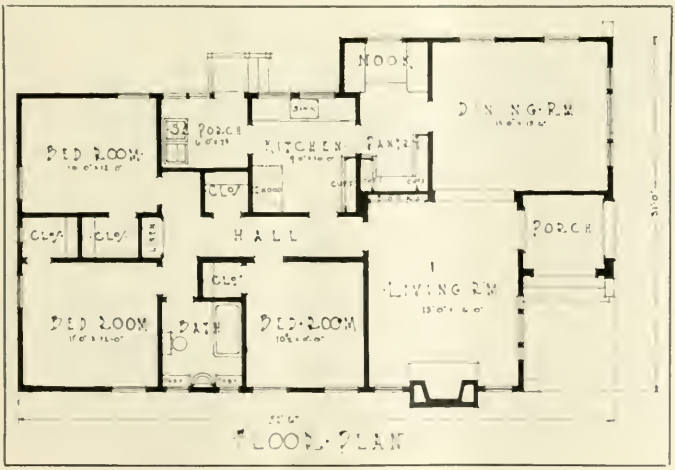
The outside walls are of greenish-cream cement-stucco over frame construction, and the trimming is done in a somewhat deeper shade of the same color combination. The roof, characterized by clipped gable peaks and by doubling each fifth course of shingles, is dark green, and the small entrance porch, which is entered from the side by way of the automobile driveway, is floored with light red cement. And especially deserving of notice, as tending to materially improve the appearance from the street, are the two groups of long casement windows on the front, with their decoratively scrolled tops—which windows also naturally help to give natural light and charm to the two front rooms.

It is in the designing of the interior that the influence of the California bungalow is especially discernible. Referring to the accompanying floor plan, it will be seen that there are particularly convenient connections, and, further, that there is an exceptionally good arrangement of closets and built-in features.

Not only does each of the three bedrooms, for instance, possess a large closet, but off the connecting hall is another roomy closet, while the built-in features include a book-case in the living room, two small drawer and shelf cabinets in the bath room, a linen cabinet in the hall, and in the kitchen are the usual conveniences in the way of cupboards, sink and so forth.

The woodwork finish in the living room and dining room consists of old ivory with mahogany trim, in the hall and three bedrooms of old ivory alone, and in the bathroom and kitchen of white enamel. Hardwood floors prevail throughout, except in the kitchen and bathroom, the latter of which has tile flooring. The walls of the kitchen and bathroom are finished, in high wainscoting effect, with a smooth, hard plaster coat, which is enameled like the woodwork, and the walls of the other rooms are papered. The fireplace in the living room is faced with dull-toned tile, finished with a wood mantel, and has a tile hearth.

The house has no basement or cellar, but is equipped with built-in gas radiators. It is located in Los Angeles, California, and was designed by William Barber and J. A. Larralde, architects, of that city.





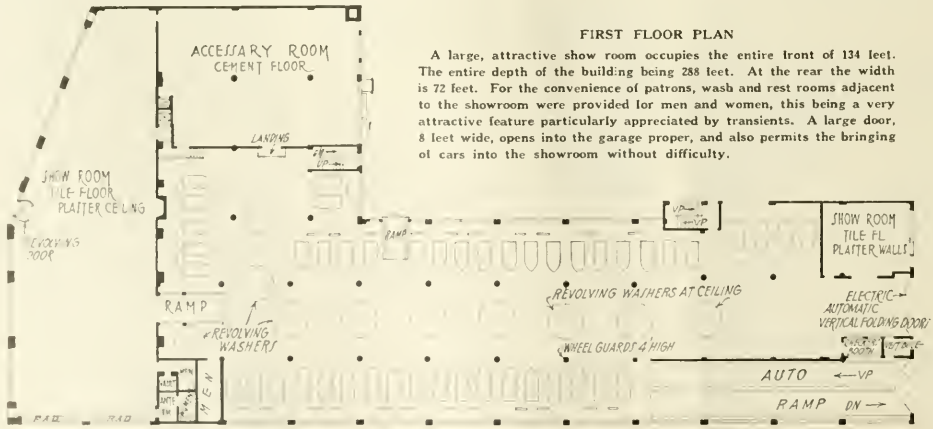
An Attractive Show Room of this Modern

THOMPSON & BINGER INC., Engineers and Contractors

BUILDING a large garage, capable of accommodating 300 cars, was the accomplishment by the builders for the Wilmington Auto Company, of Wilmington, Del. This garage presents some unusual features of design and construction, and a description of same may prove of considerable interest to the reader.

In addition to garage facilities, the Wilmington Auto Company also handles new cars, second-hand cars, tractors, accessories, and does repairing and painting work, and it was necessary to provide adequate space for each department.

The owners desired to have an attractive showroom, and what is believed to be one of the largest showrooms in the country was designed to house the new-car department. This showroom has the shape shown on the accompanying plan, and it is worthy of note that the entire area is absolutely free from any obstructions. We believe this to be rather



FIRST FLOOR PLAN

A large, attractive show room occupies the entire front of 134 feet. The entire depth of the building being 288 feet. At the rear the width is 72 feet. For the convenience of patrons, wash and rest rooms adjacent to the showroom were provided for men and women, this being a very attractive feature particularly appreciated by transients. A large door, 8 feet wide, opens into the garage proper, and also permits the bringing of cars into the showroom without difficulty.

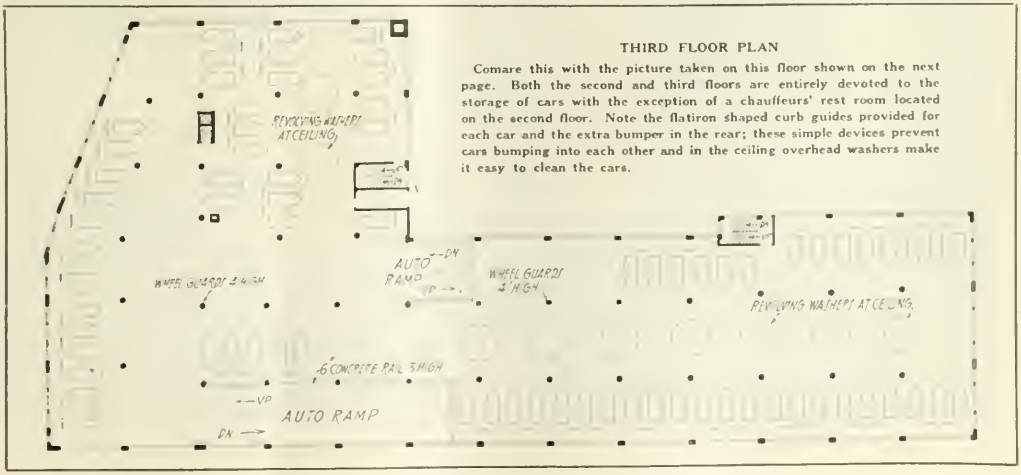


Forms the Novel Feature 300 Car Garage

Described and Illustrated By RAOUL C. GAUTIER, C. E.

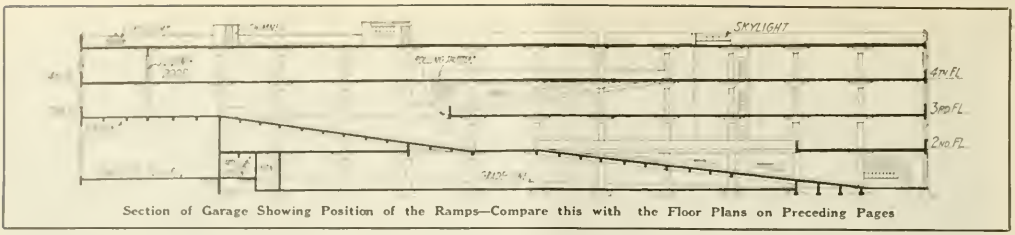
unusual, considering that, at the wider end, the clear width of the room is 46 feet. This result was obtained by providing large concrete girders to carry the two stories above, the load being brought down by columns, and being concentrated at the middle of the span. The engineers wished to avoid the ugly appearance of the straight girders, and, taking advantage of the plasticity of the concrete, they designed these girders with a curved soffit, thus greatly adding to the appearance of the room, as will be seen in the interior view, on the opposite page.

These girders and the upper part of the walls were plastered and finished with a sand finish. The rough surface of the finish is contrasted by a walnut panelling running to about two-thirds of the height of the wall, and in the center a large fire-place adds cheerfulness to the room, while the floor, being made up of tiling of a warm color, presents beautiful effects. The tile selected was absolutely oilproof, thereby eliminating



THIRD FLOOR PLAN

Comare this with the picture taken on this floor shown on the next page. Both the second and third floors are entirely devoted to the storage of cars with the exception of a chauffeurs' rest room located on the second floor. Note the flatiron shaped curb guides provided for each car and the extra bumper in the rear; these simple devices prevent cars bumping into each other and in the ceiling overhead washers make it easy to clean the cars.



Section of Garage Showing Position of the Ramps—Compare this with the Floor Plans on Preceding Pages

unsightly oil pans under the cars.

At the back of the building there is a small showroom for second-hand cars and tractors, and we find there also the main entrance, or rather entrances, to the garage. There are two doors, electrically operated; one leads from the first floor and the other to a ramp going to the second floor. Between these two doors, the checker's booth was provided. This room contains the motors operating the doors, so that the checker can open same by a single operation of pushing a lever. Particular attention is called to the size of these doors, which are 18′ 6″ wide and 11′ 6″ high. It was quite a problem to make them work, but difficulties have been surmounted.

As for the fourth floor, part of it is used for storage, but the balance is devoted to the repair and paint shop. It is rather unusual to locate the repair shop on the top floor, but, being easily reached by means of the ramps, it was deemed better to put this shop where it would get the best light and ventilation—both of which are most essential for such work.

This repair shop is equipped with all modern machine tools. It is interesting to note that, while the main part of the floor; i. e., that devoted to damaged cars, is finished in concrete, that next to the machines and benches is finished with wood blocks, thus providing a softer footing for the mechanics. The connection between the wood block area and the concrete area is made by means of a small ramp. As it is often necessary to bring supplies to the repair room, it is connected to the accessory room downstairs by means of a dumbwaiter.

Excellent light and ventilation are afforded by the windows and skylights. The ventilation, however, was not considered sufficient, and special fans, which may be seen on the picture of the front elevation of the building, were installed so that, with all openings closed, at least three changes of air per hour are assured, thereby reducing greatly the obnoxious effects of the exhaust gases produced when motors are being tested.

A blacksmith shop was installed close to the main shop, the enclosure around same being made absolutely fireproof, thus minimizing the results of fire and the explosion.

The Wilmington Auto Company does its own painting, and, to house this department, a special paint shop



View on Third Floor, Showing Ramps in Use by Cars, Also the Curbs for Each Car

was installed. The heat in this room having to be constant, an independent piping system, thermostatically controlled, was installed, and, to avoid condensation on the roof, special insulation was provided between the concrete slab and the roofing.

Special mention might be made regarding the construction of the ramps. The grade nowhere exceeds 14%, and cars do not have the slightest trouble in making the grade, especially since, in order to avoid slippery surfaces, the ramps were finished with alundum—a finish, which, by the way, was very successful. These ramps were made 18 feet wide throughout, with a curb separating them in two tracks, so that cars can travel up and down without interference. In the middle of each track, a small groove was provided to collect the oil dripping from the cars, and this oil is collected in a catch basin at the foot of each ramp, thus doing away with the very objectionable coating of oil usually present on similar inclines.

This garage was designed so as to provide for the largest number of cars, at the same time leaving alleys open for traffic. It is then possible for the car owner to enter the building through the showroom, go up in the push button electric elevator to the floor where his car is kept, and drive out without interference, and without having to pass through dirty entrances, or to climb up through greasy stairways.

Gasoline stations were provided at all floors, and compressed air, being brought through the columns, may be obtained at a number of places on each floor. A drain and an overhead washer were provided in each alley bay so that car owners can lock their cars at night, since it is only necessary to push the cars a few feet forward or backward in order to bring them to the washing space.

This building was entirely built of reinforced concrete, including the front and back elevations, the former of which is on one of the main streets of the city. Nothing was done to disguise the concrete, which was simply rubbed with carborundum and painted with a waterproof paint and decorated with a few tile inserts. As far as the structure is concerned, the design of the girders over the showroom is interesting on account of the unusual loads carried, and also in view of the fact that they were designed, as a whole, with the columns, instead of separate units as is usually the case.

The floors were of the flat slab type, except that over the showroom, which was of the beam and girder type. A glance at the plan will show that the building, being very irregular in shape, it was not possible in every case to make the panels square or even rectangular, and that some of the panels might be thought too crooked to be built with flat slab. Nevertheless, this type of construction was used in all panels and with complete success. These floors were finished with a ¼-inch monolithic finish, containing a liquid hardener, and are giving absolute satisfaction. Incidentally, we might mention that some Fordson tractors (which have wheels equipped with angles to insure a better grip) have been run over these floors without making any indentation.

As will be noted, leaders for the roof and for the floor drains were built inside the interior columns. No special provision was made in the design of these columns, except that all the load was assumed to be carried by concrete and vertical bars, and no hooping, except ¼-inch ties to hold these vertical bars, was provided. This building was designed and built by Thompson & Binger, Inc., engineers and contractors, of New York.

Determining *the* Amount *of* Water *to* Use *for* Concrete

DO you know that the slump test is the simplest and most practical way of determining the proper amount of water to use in mixing concrete? say the experts of the Portland Cement Association.

The correct cement-water ratio for any concrete mixer will develop the maximum strength of the concrete. A knowledge of how to determine this ratio is a matter of importance to the builder.

The slump test is a simple, easy, and practical method of making this determination. The only apparatus necessary is a special mold, made from sheet metal, preferably non-corrosive, in the form of a frustum of a cone 4 inches in diameter at the top, 8 inches in diameter at the bottom, and 12 inches in vertical height.

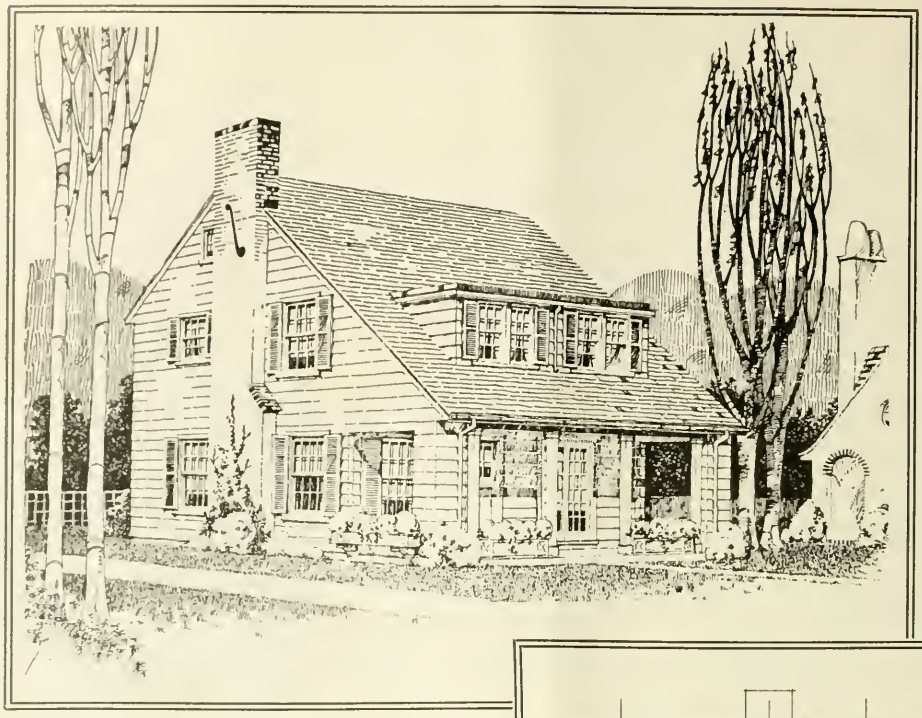
After thorough mixing the concrete is placed in the mold in three or four successive layers, each layer carefully puddled or rammed with a blunt-pointed ⅝-inch round rod. The metal mold is then removed with a steady, vertical lift, leaving the concrete free to spread at the base. The "slump" or reduction in vertical height of the pile of concrete which results, is an indication of the consistency of the mixture.

The consistency which produces concrete of maximum strength is known as a "normal" mixture, and has a slump of about one inch. A reduction in the amount of water of 10 per cent. below that required for a normal mixture will change the slump to only one-half inch and decrease the strength of the concrete about 30 per cent.

Increasing the water 10 per cent. above normal will result in a slump of almost three inches, and a loss of at least 15% in strength.

A portion of the strength of the concrete must sometimes be sacrificed in order to obtain the plasticity of mixture required by the manufacturing processes employed. For pavements, floors and large foundations, the slump should not exceed 3 inches.

For thin, reinforced concrete walls where smoothness is required but compacting is difficult, a mixture with a slump of 6 or 7 inches is permissible because its wet consistency practically eliminates the necessity of tamping. Remember: Do not make your mixture more plastic than is required by the nature of your work.



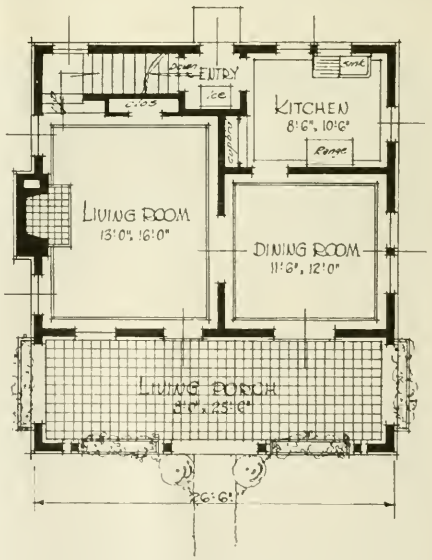
Well Planned Small House Design

Specially Prepared for Readers of
BUILDING AGE and THE BUILDERS' JOURNAL
Together with Constructive Details

By R. C. HUNTER & BRO., Architects,
New York

BUILDERS for the good of the industry should always discourage people wanting to build a cheap house, both in design and in construction. If more of us would turn down work that does not reflect credit on the building craft, it would go a long way to educate the public to ask and desire better construction.

In no particular place does better design and construction show to more advantage than in our homes. Let us build them so that they will be good to look at and comfortable to live in. The designs shown in these pages are examples of good design—something that will be a credit to the neighborhood as well as to the building contractor who erects it.



FIRST FLOOR PLAN

SCALE OF FEET
0 5 10 15

FADS and fancies in house design, as in most everything else, are but short lived. Good design is a matter of taste and proportion, and, as a rule, is akin to simplicity.

Freak houses, built just because they are odd, do not represent the best in home building, but rather otherwise. The curious holds one's interest for a short time, then it becomes loathsome; this applies with double force to home building. Once up, a building stands for years, a monument to good taste, or to bad.

What a community needs is well designed attractive homes, planned along sane rational lines—economical, simple, neat and charming—a credit to the owner and a credit to the community, a home that will give one a sense of pride.

It costs no more to build homes of this type than it does to build the monstrosities one so often sees; in fact, the cost of a well-designed house is often much less than one built haphazard.

The little house shown herewith is a good example of what can be done in the way of simplicity, economy and good design.

The plan is rectangular in shape (the most economical in form, as breaks and extensions are expensive) even the living porch comes under the one main roof; the partitions are plumb over each other and the construction is simple.

The room arrangement is most compact, full, square, and livable rooms; no nooks, waste corners or extravagant halls.

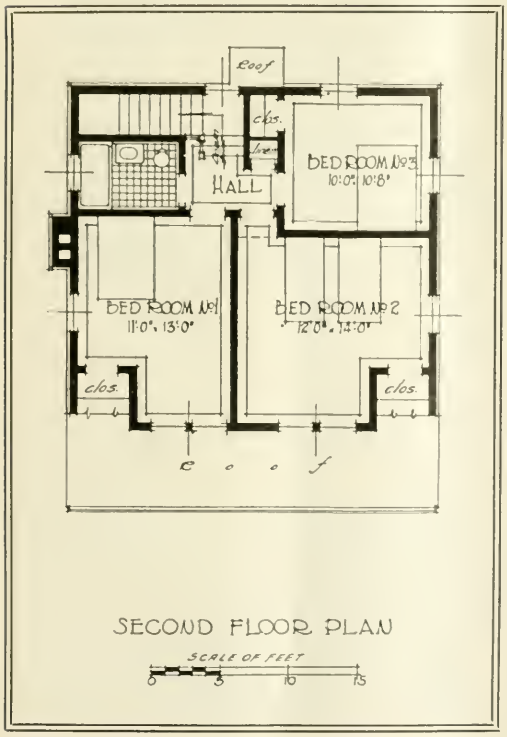
The hall required for the second floor has been reduced to a minimum size; giving three nice bed rooms and a bath on this floor.

The exterior of the house leaves nothing to be desired. The long sloping roof that extends down over the living porch gives a pleasing cottage effect, while the broad dormer allows a full second floor. The simple detail of the cornices, the well-proportioned windows and the broad brick chimney; all lend strong character that no amount of "gingerbread" would give.

The flower boxes encourage one to plant the grounds and complete an ideal little home. Cost about $6,700.

Quantity Survey *of* Small House

Shown on Preceding Page



THE quantities given are for estimating. All measurements are NET unless otherwise noted; areas given for such items are sheathing, flooring, etc., are net areas to be covered with no allowance for matching, waste, etc. Minor outs have been disregarded.

Such items as clearing site, temporary work and protections, scaffolding and general equipment and supplies, have not been included.

Such items as are marked "Unit" are to be estimated in a lump sum, following requirements of plans and specifications.

Excavation

(Excavation for pipe trenches not included)

Excavation for cellar	174 cu. yds.
Excavation for footings	12 cu. yds.
Excavation for areas	5 cu. yds.
Excavation for trench walls	11 cu. yds.
Excavation for leader drains and dry wells	8 cu. yds.
Backfilling around walls, etc.	32 cu. yds.
Leader drains and dry wells	
Field stone for dry wells	7 cu. yds.
4 in. salt glazed tile drain pipe	24 lin. ft.
4 in. elbows	4

Masonry

Concrete for cellar walls	675 cu. ft.
Concrete for footings	140 cu. ft.
Concrete of trench walls	145 cu. ft.
Concrete for area walls	100 cu. ft.

BLUE Print Plans and Specifications of many Beautiful Homes of Moderate Cost can be supplied at a nominal price by BUILDING AGE and the BUILDERS' JOURNAL, 912-920 Broadway, New York.

Cellar floor (3 in. concrete and 1 in. cement finish)	495 sq.	ft.
Area bottoms (brick and sand)	30 sq.	ft.
Porch floors (12 in. cinders, 3 in. conc. and 1 in. cement finish colored and blocked off)	234 sq.	ft.
Concrete forms	2100 sq.	ft.
Pointing cellar window sills	16 lin.	ft.

Brick Work

Common brickwork for chimney (or 2.8 M.)	140 cu.	ft.
3 in. bluestone chimney caps (2 ft. 0 in. x 3 ft. 8 in.)	1 unit	
Face brick for fireplace hearth and jambs (or 105 brick)	15 sq.	ft.
Fire brick for fireplace (or 75 brick)	15 sq.	ft.
8 in. x 12 in. T. C. flue lining	62 lin.	ft.

Mason's Iron Work

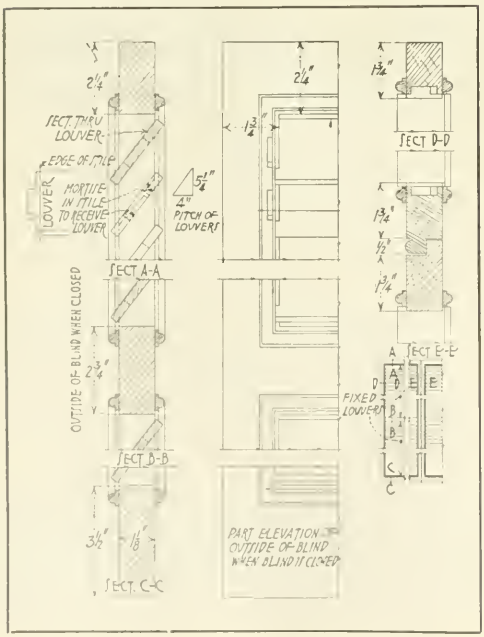
Fireplace damper (3 ft. 0 in., operating with throat, etc.)	1 Unit	
C. I. Ash dump	1 Unit	
C. I. Cleanout door for ash pit (16 in. x 12 in.)	1 Unit	
C. I. Cleanout door for boiler flue (8 in. x 8 in.)	1 Unit	
Thimble for boiler flue (9 in. dia.)	1 Unit	
Chimney iron, 3 ft. 0 in. long, hand forged	1	

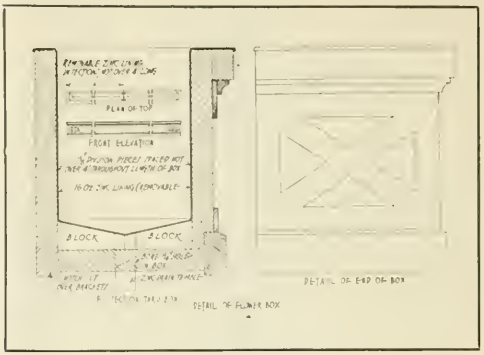
Plastering

Three coat Patent plaster on metal lath, gross (Net 455 sq. yds.)	550 sq. yds.	
G. I. Corner beads	90 lin.	ft.

Tile Work

Tile Work for Bath Room Floor (1 in. hex. white)	27 sq.	ft.
Wainscot (3 in. x 6 in. white wall tile)	92 sq.	ft.
6 in. base	14 lin.	ft.
Cap	23 lin.	ft.





Sheet Metal Work

Tin roof on dormer	189 sq.	ft.
Tin flashing for roofs, etc	25 lin.	ft.
Copper flashing and counterflashing for chimney, etc	7 lin.	ft.
Copper flashing for column caps	4 caps	
4 in. half round hanging gutter	55 lin.	ft.
3 in. dia. copper leaders	61 lin.	ft.
Bends for same	10	
Gutter thimbles	5	
3 in. x 4 in. G. I. gas range vent	24 lin.	ft.
Cap and thimble for same	1	

Carpentry

TIMBER

All No. 1 common stock, rough unless noted.

Cellar Girders—		
6 in. x 10 in. spruce—1/14, 1/8	110 F. B. M.	
2 in. x 3 in. nailer—44 lin. ft.	22 F. B. M.	
Sills—		
4 in. x 6 in.—4/14, 1 1/2, 2/10, 1/8	192 F. B. M.	
Posts—		
4 in. x 6 in.—2/18, 2/16, 2/10	176 F. B. M.	
Studs, girts and plates, 1st floor—		
2 in. x 4 in.—104/10, 52/8	971 F. B. M.	
Studs, etc., 2d floor—		
2 in. x 4 in.—203/8	1083 F. B. M.	
1st floor joists—		
2 in. x 10 in.—17/14, 17/12	736 F. B. M.	
2d floor joists—		
2 in. x 10 in.—46/14	1070 F. B. M.	
2d floor ceiling joists—		
2 in. x 4 in.—46/14	429 F. B. M.	
Rafters—		
2 in. x 6 in.—52/14	728 F. B. M.	
Ridge—		
2 in. x 8 in.—2/14	37 F. B. M.	
Porch ceiling beams, etc.—		
2 in. x 4 in.—26/10	174 F. B. M.	
Porch plates—		
2 in. x 10 in.—4/10, 2/8	93 F. B. M.	
Col. cores—		
4 in. x 4 in.—4/8	43 F. B. M.	
Cornice Outlookers—		
2 in. x 4 in.—75 lin. ft.	50 F. B. M.	
Floor bridging—		
2 in. x 2 in.—250 lin. ft.	83 F. B. M.	
Cellar partitions—		
2 in. x 4 in.—4/14, 7/12	93 F. B. M.	
Sheathing (7/8 in. x 8 in. shiplap)—		
Walls—to cover	1930 sq.	ft.
Flat Roofs—to cover	160 sq.	ft.
Sheathing paper (waterproof)	2200 sq.	ft.
Shingle lath—(7/8 in. x 2 in.)	2650 lin.	ft.
Grounds (3/4 in. x 2 in., surfaced 1 side)	1000 lin.	ft.

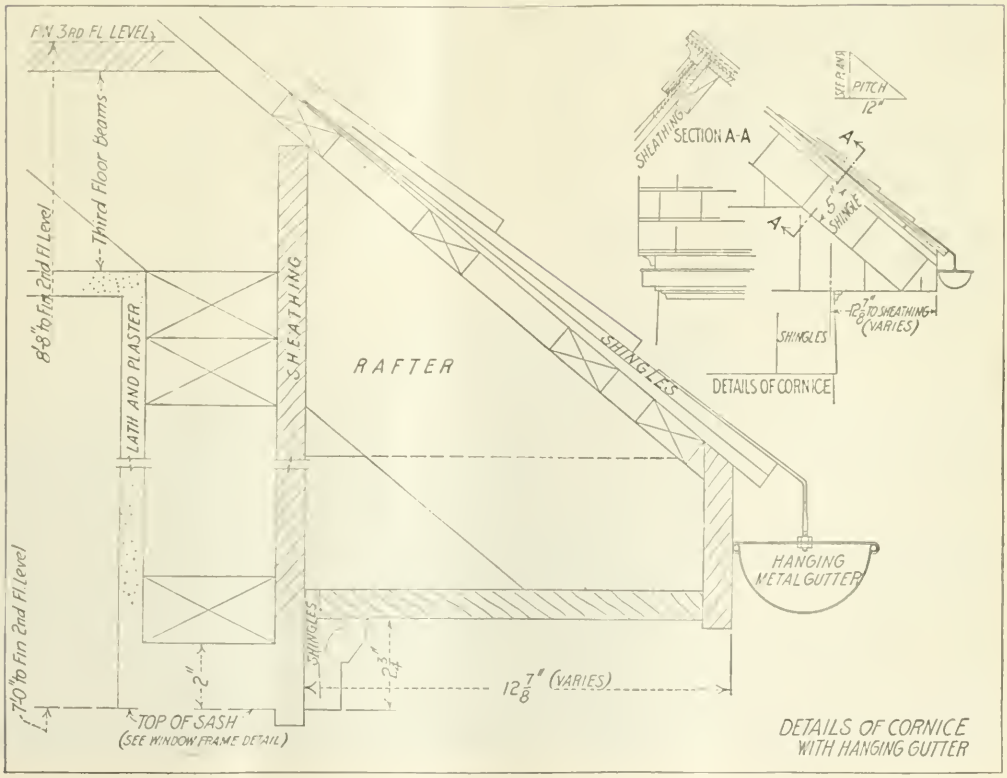
Carpentry—Continued

Sheathing for cellar partitions—		
(7/8 in. x 8 in shiplap)—to cover	280	sq ft
Rough flooring (7/8 in. x 8 in. shiplap)		
1st floor—to cover	550	sq ft
Furring (7/8 in. x 2 in.)	100	lin ft
Shingle roofs (18 in. stained shingles)		
10.5 squares	7300	shingles
Shingle sides (24 in. stained shingles)		
14.5 squares	4800	shingles

Exterior Finish

Watertable, 7/8 in. x 2 in. strip	110	lin. ft
Main cornice—		
7/8 in. x 12 in. soffit	55	lin. ft.
7/8 in. x 5 in. fascia	55	lin. ft.
1 1/4 in. bed moulding	55	lin. ft.
Raking cornice—		
1 1/2 in. cove	98	lin. ft
Dormer cornice—		
7/8 in. x 4 in. soffit	60	lin. ft.
7/8 in. x 4 in. fascia	60	lin. ft.
2 in. mould	60	lin. ft.
7/8 in. x 2 in. cap	60	lin. ft.
4 in. bed mould	60	lin. ft.
Flower boxes—		
(1 1/8 in. wood boxes lined with zinc)—		
12 in. x 12 in. x 7 ft. 0 in. long	2	Units
12 in. x 16 in. x 6 ft. 0 in. long—portable	2	Units
Brackets for boxes	4	

Porch Finish—		
6 in. x 6 in. box cols., 7 ft. 8 in. long with cap and base	4	
7/8 in. x 6 in. soffit	46	lin ft.
7/8 in. x 8 in. frieze	46	lin. ft.
2 in. bed mould	24	lin. ft.
5/8 in. x 7/8 in. cove	74	lin ft
5/8 in. x 4 in. M. & B. ceiling to cover	230	sq. ft
1 3/4 in. x 8 in. x 6 ft 6 in sills	2	
7/8 in. moulding	26	lin. ft
7/8 in. x 6 in. x 6 ft 6 in. soffit	2	
Windows—		
Frames complete with sash, outside trim, etc		
Sash 1 1/2 in. thick, glazed D. T		
Cellar Windows—		
Single top hung sash, casem. 3 ft. 0 in. x 2 ft. 0 in. 4 light	5	
First Floor Windows—		
Single D. H. sash, 3 ft. 0 in. x 5 ft. 0 in. 16 light	3	
Single D. H. sash, 2 ft. 6 in. x 3 ft. 2 in. 12 light	2	
Mull. D. H. sash ea. 2 ft. 6 in. x 3 ft. 2 in. 1/2 light	2	
Second Floor Windows—		
Single D. H. sash, 2 ft. 8 in. x 4 ft. 6 in. 12 light	4	
Single D. H. sash, 2 ft. 6 in. x 3 ft. 2 in. 12 light	2	
Mull. D. H. sash ea. 2 ft. 6 in. x 3 ft. 2 in. 1/2 light	2	



Exterior Finish

Attic Windows—
- Single casem. sash 1 ft. 4 in. x 2 ft. 0 in. 4 light..... 2 ....
Blinds (1 1/8 in. thick, movable louvres)—
- 3 ft. 0 in. x 5 ft. 1 in..... 3 pr....
- 2 ft. 6 in. x 3 ft. 3 in..... 6 pr....
- 2 ft. 8 in. x 4 ft. 7 in., pr..... 4 pr....
- 2 ft. 6 in. x 3 ft. 6 in. pr..... 2 pr....

Exterior door frames (1 3/4 in. thick, rabbeted). Complete with outside trim—
- Frame for front ent. Door 2 ft. 10 in. x 7 ft. 0 in..... 1 .....
- Frame for rear ent. door, 2 ft. 6 in. x 6 ft. 8 in..... 1 .....
- Frame for doors to Living Porch, 4 ft. 8 in. x 7 ft. 0 in..... 1 .....

Exterior doors (all to detail)—
- Front ent. door, 2 ft. 10 in. x 7 ft. 0 in., 1 3/4 in. glazed..... 1 .....
- Rear ent. door, 2 ft. 6 in. x 6 ft. 8 in. x 1 3/4 glazed..... 1 .....
- Doors to Living Porch, pr. ea. 2 ft. 4 in. x 7 ft. 0 in. x 1 3/4 in. glazed. 1 pr.....

Finished Flooring—
- 1st and 2d stories, comb. grain Y. P., 7/8 in. x 2 1/4 in.—to cover..... 970 sq. ft.....

Lining paper under floors..... 850 sq. ft.....
Scuttle to Attic, 2 ft. 0 in. x 3 ft. 0 in.. 1 Unit.....
Slat floor under laundry tubs, 3 ft. 0 in. x 4 ft. 0 in..... 1 Unit.....
Joist hangers (1 1/4 in. x 2 in. W. I.)—
- For 2 in. x 10 in. beams..... 4 .....
- For 4 in. x 10 in. beams..... 4 .....

Cement filled pipe cols. in cellar, 4 in. dia. x 7 ft. 6 in. long, with cap and base ..... 2 .....

Interior Finish

Door Trim—
(Whitewood Unless Noted)
7/8 in. jambs, 1/2 in. stops, 7/8 in. x 4 1/4 in. moulded and mitered trim with wall moulding. Trim both sides—
- For doors 2 ft. 6 in. x 6 ft. 10 in..... 2 sets.....
- For doors 2 ft. 6 in. x 6 ft. 8 in.... 4 sets.....
- For doors 2 ft. 4 in. x 6 ft. 8 in.... 4 sets.....
- For doors 1 ft. 8 in. x 6 ft. 8 in.... 1 set.....
- For doors (cellar) plain 2 ft. 6 in. x 6 ft. 6 in..... 1 set.....

Trim for inside of exterior doors—
- Front ent. 2 ft. 10 in. x 7 ft. 0 in.... 1 set.....
- Rear ent. 2 ft. 6 in. x 6 ft. 8 in..... 1 set.....
- To Living Porch pr. 4 ft. 8 in. x 7 ft. 0 in. ..... 1 set.....

Trimmed openings finished same as for doors—
- Opg. 5 ft. 0 in. x 6 ft. 10 in..... 1 set.....

Trim for small door to plumbing pipes 18 in. x 36 in..... 1 set .....
Trim for windows—
7/8 in. x 4 1/4 in. moulded and mitered trim with wall moulding, 1/2 in. stops, 1 1/8 in. moulded stool, 7/8 in. moulded apron, 5/8 in. x 7/8 in. cove under stool.
- For windows, single 3 ft. 0 in. x 5 ft. 0 in. ..... 3 sets.....
- For windows, single, 2 ft. 6 in. x 3 ft. 2 in. ..... 4 sets.....
- For windows, mull. ea. 2 ft. 6 in. x 3 ft. 2 in..... 2 sets.....
- For windows, mull. ea. 2 ft. 6 in. x 3 ft. 6 in. ..... 2 sets. .....
- For windows, single, 2 ft. 8 in. x 4 ft. 6 in. ..... 4 sets.....

Base—
- 7/8 in. x 6 in. moulded..... 290 lin. ft.....
- 7/8 in. x 4 in. plain (closets)..... 48 lin. ft.....
- 2 in. base mould..... 290 lin. .....
- 1/2 in. quarter round at floor..... 330 lin. ft.....

Picture moulding (7/8 in. x 2 1/4 in.).. 330 lin. ft.....
Mantel for Living Room..... 1 Unit.....
Interior Doors—
(2 cross panel birch veneer)—
- Door 2 ft. 6 in. x 6 ft. 10 in. x 1 1/2 in 2 .....
- Door 2 ft. 6 in. x 6 ft 8 in. x 1 1/2 in. 4 .....
- Door 2 ft. 4 in. x 6 ft. 8 in. x 1 1/2 in. 4 .....
- Door 1 ft. 8 in. x 6 ft. 8 in. x 1 1/2 in. 1 .....

Solid pine cellar door—
- 2 ft. 6 in. x 6 ft. 6 in..... 1 .....

Whitewood door to plumbing pipes.
- Door 1 ft. 6 in. x 3 ft. 0 in..... 1 .....

Closet shelving (7/8 in. x 12 in. pine).. 36 lin. ft.....
Hook strip (7/8 in. x 4 in.)..... 50 lin. ft.....
Rabbeted shelf cleat..... 26 lin. ft.....
1 in. dia. pipe clothes rod..... 12 lin. ft.....
Kitchen cupboard with countershelf drawers, doors, etc.—
- Front 4 ft. 0 in. x 8 ft. 6 in..... 1 Unit.....

Main stairs, 1st to 2d story, 15 risers, 3 ft. 2 in. wide, balustrade, etc..... 1 flight.....
Cellar stairs, 12 risers, box pattern... 1 flight.....

Some Stone Wall

HERE is a picture of what one would think is part of the great Chinese Wall, but we are wrong. It is not the product of the heathen Chinese but the eccentric whim of a New York millionaire.

This would probably be all right in some isolated locality but when such a crazy idea is planted in a big city, it is a detriment and an eyesore and a monument of selfishness.

Who would like to be the owner of the adjoining property? Certainly the owner of the residence next to this wall as shown in our picture must feel rather anarchistic towards a city government that will allow the perpetration of such an outrage.—**Albert Fair.**



The Story of How William N. Worrall of Kennett Square, Pa., Made Good in the Building Line Will Be an Inspiration to Every Young Man in the Building Industry.



On His Car the Well-Known "W" Trade Mark Appears, Besides Mr Worrall Always Wears a Good Trade Mark Himself. It Is His Smile. Nobody likes a Grouch.

The Simple Interesting Story *of* One Building Contractor's Success

It Will Encourage the Young Man in the Building Industry to Try His Best

Pictures and Description
By C. H. THOMAS

THERE are many mechanics needed in the various branches of the building industry. The proper training of these is quite some problem but like everything that has to be met some method will be evolved to get hold of the proper young men and to train them to fill the places of those that are dropping out of the ranks.

Nothing will inspire the ambitions of a young man so much as reading a story of the success that has been won by a man who has grown up in the business. Likewise many a man with years of experience will find it interesting to know what the other fellow has done and perhaps find a few points that are worthy of following.

The subject of this little sketch is Mr. William H. Worrall, who was born at Kennett Square, Pa., in the same town he is doing business today. This was back in the year 1882 and his education was secured in the public school at that place, and curiously enough, the first job he worked upon in the building line was as a helper on a country school. It was therefore of interest to note that in 1911, when he was twenty-nine years of age, he started in the contracting game himself and the first job he secured was that of building a school house.

Since that time he has given most of his attention to the building of residences, although there are a number of various other kinds of construction that he has successfully erected. In this article we give a few illustrations of some of the buildings erected by him. We give several views of Mr. Worrall's shop for he, like every other successful contractor, finds it convenient to have a shop so that he can turn out work to advantage. Mr. Worrall has found out that doing a good piece of work is his best recommendation, in fact, he states that he stakes his reputation on the class of work he has been doing. "Do a good job at a fair profit" is the motto that Mr. Worrall has followed.

In his local newspaper he carries a short advertisement and when interested parties appear he can refer them to any number of satisfied customers. Mr. Worrall is a typical contractor and has been a reader of BUILDING AGE for many years and has found it a real help in his business.



View of Shop, Trucks and Some of the Men

Let us go into his shop. In the office, we find different equipment such as typewriter, adding machine, check protector, etc. Contracting is a regular business and needs such appliances. In his shop he has various woodworking machines. These are driven by electric motors. On the job he has found it economical to have a concrete mixer and a portable saw, these being driven by a gasoline engine.



View of the Worrall Quarry at Avondale, Pa., Where He Obtains His Stone.



Gas Engine and Saw Out on a Job Used by Worrall to Cut Rough Timber.

When the building boom came, Mr. Worrall was well equipped with long experience in the building line and was able to launch into larger fields than that which usually is the lot of a small town carpenter and builder. He acquired a stone quarry, built a shop with many modern conveniences and gathered about him a number of the right men.

Many manufacturing plants are located in the vicinity and from his reputation he was able to secure contract after contract. A large amount of the residence construction in this locality is stone, therefore he found it economical to work a quarry. The grade of stone is a good one and besides using it for his own contracts he sells a good deal of stone, some of it being shipped to distant points.

To get around and transport materials he finds use for several cars. He makes it a point to be prompt and efficient on all his contracts and everybody knows when he starts a job, for he puts up a quaint and catchy sign representing a finished home and this never fails to get attention from passers-by. Then he has a sort of a trademark that he uses on his cars and other signs. The big "W" reminds everybody that Worrall is on the job.

Mr. Worrall has been engaged for many years in building factories, bungalows, barns, office buildings and apartment houses and on quite a few jobs he was instrumental in transforming some old buildings into modern affairs.



Double House Built by Wm. N. Worrall. Note Sign with "W" Leaning Against Porch.



Large Factory Building Erected During Winter of 1921-22 at Yorklyn, Del., for National Fibre Co. Built by Wm. N. Worrall.

Mr. Worrall has found that it pays to keep posted on the new devices both for erecting work and equipping of buildings, therefore when any prospective owner intends having something done they come to him for advice and he is usually able to give some sound, practical information on the subject.

Mr. Worrall gives personal attention to the buying end as he is able to save hundreds of dollars by looking after this detail himself. He knows from his long experience just what materials and supplies will serve the best purpose. It may truly be said that to get the most out of a contract one must be a good buyer, and this maxim is one that is being successfully followed by Mr. Worrall.



Office and corner of workshop of Mr. Wm. N. Worrall



One important method that was found of benefit is the daily reports of his men on the progress of each job. With this information on hand he knows the conditions exactly and he can schedule his materials and supplies in an economical way, so that everything will be on hand

Mr. Worrall has always made it a point in his business to please the customer, and he makes a special point of doing this even if it means a little less profit. There is not a job that he has turned out that he has not left the owner with a hand shake and, on the other hand, the owner, being well satisfied, has been one of the best advertisements Mr. Worrall could obtain. Surely the good word of a satisfied customer is golden and worth earning.

Of course, one necessary element in the success of any business, and especially that of building contracting, is courage and faith in one's self. One important point to be learned by any one wishing to be a successful contractor is not to do too much of the actual work one's self, and Mr. Worrall has learned to supervise. He looks after the running of the business, and that is a man size job. He has efficient help who have become specialists in their respective kind of work. Most of those around him are bright young men and he has carefully trained them to his ideals. They are enthusiastic workers and it is "Get the job done quickly and good" with them.

Corner of shop showing power machinery—all with electric motors. Each machine is equipped with guards as Safety First is the motto of this establishment.



Mr. Worrall's home is one of the best advertisements he has, proclaiming him a successful home builder. It is solid and substantially built of stone from his own quarry. It contains many features that interests prospective home builders.





Interesting view of living room looking towards the sun parlor.

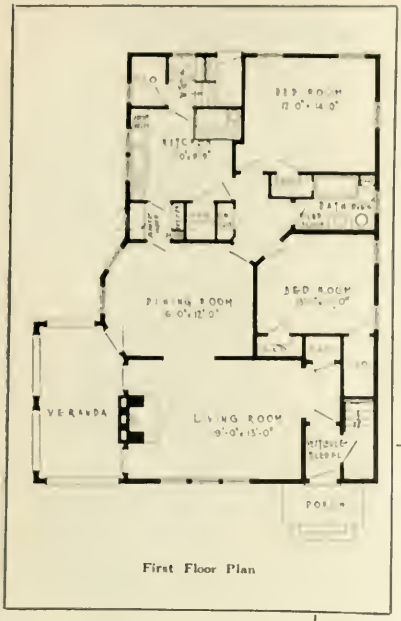
Two Family That Looks One Family

H. MESSINGER

BUILDERS are often called upon to submit designs of a two-family house that will have the appearance of being occupied by only one family, and it will therefore be of interest to study this design.

The actual house shown here was recently built at Montclair, N. J., and the casual passerby thinks it a good size one-family residence with large living porch and sleeping porch above.

The builder has a good argument to offer the prospective home owner for building a two-family house. There is always the financial side, which is worth considering, as the rental of one of the floors will go a long way towards paying the upkeep of the entire house, making the cost of ownership very small indeed.



First Floor Plan

Dwelling Like a Design

FISHER, Architect

Practically two separate houses are provided in this design. There is, of course, a common entrance vestibule, which gives the one-family house appearance, which is so desired.

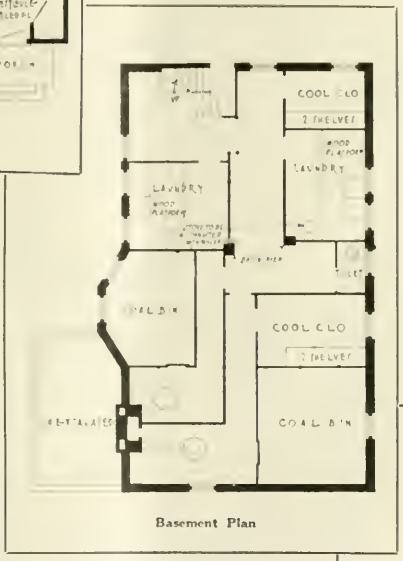
In both of these apartments one enters directly into the living room. A very pleasant feature of this living room design is the way the porch extends beyond the end of the dining room. This porch can be closed off by French doors or left simply with a cased opening.

COMPLETE working plans and specifications in blue print form of Beautiful One and Two-Family Homes may be obtained at a nominal price from Building Age and The Builders' Journal, 912-920 Broadway, New York.

An interesting picture of one of these living rooms is given on the opposite page.

A simple but attractive design is given of a brick fireplace. The wood mantel shelf is finished the same as the trim of the room. There is nothing expensive or elaborate about this, but it is certainly a pleasing design.

The dining room has a bay window, one side of this being a door opening onto the porch so that it can be easily reached from either room. This is certainly a very pleasing feature and builders can often introduce it in many homes, as it has many points to commend it.



Basement Plan

The kitchen is entered from the dining room through a small pantry but in a direct line. At the rear of the kitchen there is a large storage closet and the stairway leading to a cellar and upstairs.

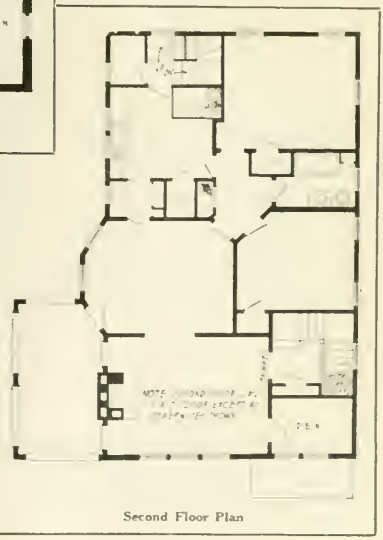
There is another closet that opens from the kitchen, useful for pots and pans, etc., and in the small hall a good sized linen closet has been provided.

The attic can be used as storage space or if desired a few extra bedrooms can be provided as there is plenty of room. When this is desired a dormer can be placed in the front so as to make use of this desirable space. Should it be desired that each apartment is to have attic room, privacy can be secured by using the rear stairway for the first floor and making a front stairway for the second floor.

The two bedrooms are of good size and have the bathroom conveniently located between them. One feature that will certainly commend itself is the small sized hall connecting the principal rooms of the house. One may go from the kitchen to the bedroom without passing through or being seen by any visitor who may be in the living room, and this has its advantages that will appeal to the women folks.

The second floor has an additional den over the space used for the vestibule on first floor. This will serve as a den, sewing room, or a boy's bedroom.

Of particular interest is the layout of the basement. Each family here has its own laundry, coal cellar, coal bin and furnace room. Plenty of windows make this cellar a really delightful space. Too often cellars are dingy and dark, but with the introduction of metal frames and sash, more light is obtainable without adding increased window space.


Second Floor Plan

Shoring, Needling *and* Underpinning

How to Use Them in Altering and Remodelling Work

By OWEN B. MAGINNIS

IN the following detailed sketches and descriptive matter, builders and practical readers will realize and learn some of the fundamental principles of "Shoring, Needling and Underpinning," the last term being applicable to foundation and basement walls.

Though these details are almost self-explaining, we must note the following facts: In the larger cities and towns these jobs are generally done by contractors and firms who make it a specialty and possess and keep in stock a plant, consisting of a variety of jack screws, pump screws, shoring timbers, wedges, ladders, hoisting tackle, etc., needful for each and every job, and hire and maintain skilled mechanics and laborers as a force under the direction of expert foremen and superintendents, who can always be relied upon to so support and secure the constituent parts of a building as to allow of the safe removal of certain other parts.

In the smaller towns and villages the practical builder must perforce do his own shoring and needling, so that a knowledge of these branches of the builders' business will be found both useful and profitable. In fact, every carpenter and builder operating in a small way does or ought to possess it. Work of this character is constantly occuring in these days when so much remodelling of the older buildings is going on.

Of course, a general knowledge and experience of building construction is essential, for these operations are important and more or less hazardous; so that no one without these qualificatons should ever attempt to undertake this kind of work. In large cities and communities

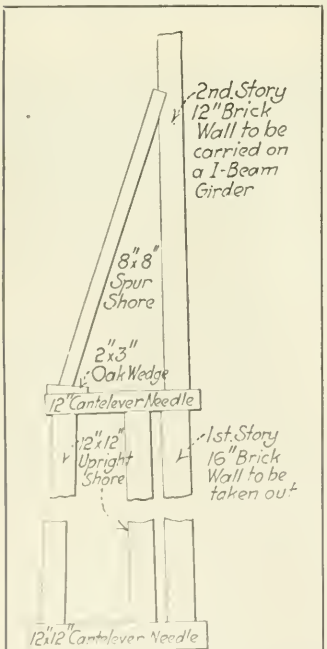


Fig. 4—Arrangement of cantilever needle supporting upper part of wall while lower section is removed where limited wide space prevents additional uright shore to support other end of needle.

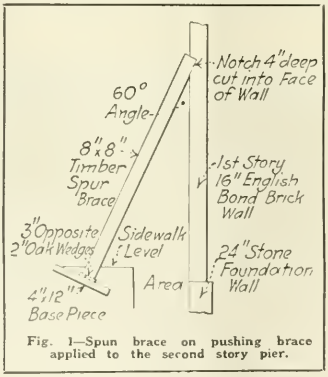


Fig. 1—Spun brace on pushing brace applied to the second story pier.

ability and capacity must be proven before permits are granted to proceed, so in this article we will consider some of the most usual and some unusual features of this auxiliary branch of the practice of building

The first job is that of supporting a pier or any upper portion of a wall in order that the lower section may be safely removed as illustrated in Fig. 1, which can be done in two ways. First by a simple "spur" shore or pushing brace with one end set in a notch cut in the wall with hammer and cold chisel to receive it, the bottom being set on a heavy timber boss or base piece set fast into the sidewalk or area floor, and from it secured tightly and immovable with reversed opposite oak wedges driven simultaneously to a firm fixidity.

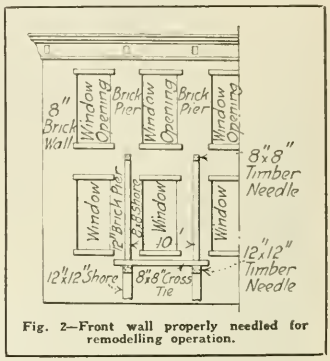


Fig. 2—Front wall properly needled for remodelling operation.

This brace should not slope at a greater angle than 60 degrees and be of good spruce or yellow pine timber, not necessarily new, but sound in heart and fibre, which may be ascertained by striking it with a heavy hatchet or maul. If it gives forth a clear ringing sound from the blow it is good, if not, set it aside and don't use it, as it may be decayed in the heart or dangerously split somewhere not visible.

The above practice is applicable for light 8 or 12 in. walls, but when it is not possible to work from the inside for heavy and high walls, "needling," as shown in Fig. 2, must be resorted to.

Here the wall must be pierced by a square hole cut through slightly larger than the timber intended to pass through it. For instance, an 8 x 8 inch timber will need a 10 x 10 inch hole, 6 x 6 inch, an 8 x 8 inch hole, and for a 12 x 12 inch stick a 14 x 14 inch hole, etc.

An old piece of a steel I-beam, 6, 8, 10 or 12 feet long, forms an excellent needle, as it does not require a large hole and is certainly safer than timber, although somewhat heavier to handle. The upper side of every hole should be smooth and level, so it is best to have it finish at

a mortar joint in the brickwork, etc., making sure of its solidity by tapping it with a hammer.

The shores must be supported from solid ground or solid sidewalks laid on solid ground, not filled in ground, nor ashes, but strong and fit enough to sustain the weight which will be transmitted to and placed from it from the superincumbent weight of the walls, piers, etc. Where weakness exists a pyramid of timbers are used to distribute the load over a larger area.

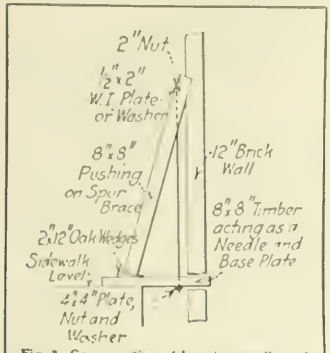


Fig. 3—Cross section of hanging needle and spur shore.

If there be vaults, coal holes, chutes or any vacant space underneath, these must be carefully examined and the bottom or base walks or area floors, if there is such, to be rested upon should be braced and made firm and trustworthy before any shoring or temporary false work is placed upon it. There must be no haste, no doubt, nor carelessness in the performance of these operations. Every detail, large and small, must be exact, sure and secure, as any slip or subsidence will not only crack the walls and plaster above and permanently injure the whole structure, but may perhaps, also cause possible injury to life or limb.

At Fig. 3 readers also will note an interesting and skilful piece of temporary false work recently done at the southwest corner of 40th Street and Sixth Avenue, New York City. To erect shoring in series or stories is somewhat unusual, but in the case illustrated it worked admirably and may be repeated successfully wherever such work may be needed.

We have still another interesting feature shown in Fig. 3 which is technically known as a "hung" shore or needle, this may be employed advantageously from the outside without disturbing either business or occupant, but the cost of making such hanging irons or stirrups is a point against its common usage.

Any application may be used as necessity or expediency may require, as may be seen in the "cantilever" system of shoring and needling represented in the next example, Fig. 4 which is capable of all sorts of placing and adaption according to the parts to be sustained, their weight, structural changes to be made, etc., according as the plans and specifications require.

It has been stated that there is an element of danger in executing the erection of temporary false work, but this can be provided against or almost eliminated by care and good judgment on the part of the man who directs and supervises the work, for it must first be very carefully and systematically thought out and prearranged before any materials are conveyed to the job.

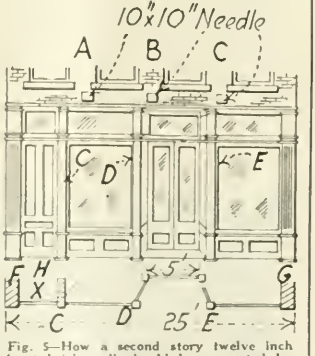
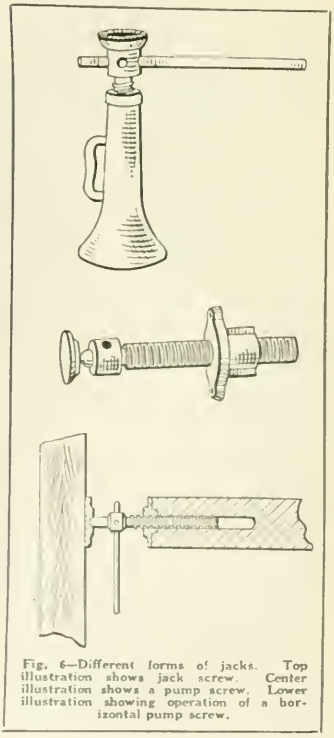


Fig. 5—How a second story twelve inch front brick wall should be supported by needles and shores in remodelling a store front.

The contractor and his foreman generally go over the premises to be altered and examine the structural details minutely, inside and out, testing walls, piers, columns, beams, partitions, etc., as to their condition, whether good or bad, comparing those actually built with the plans of the intended alterations and remodeling; making provisions and arrangements from their critical scrutiny and laying down a scheme of procedure for carrying on the work which will be both successful and profitable.

Frequently the operation cannot be contracted for by reason of extra risk and can only be done by day's work or from time to time, as conditions warrant, for it must be remembered that no two buildings were ever built alike, but always differ as to their structural constituent parts, so only an experienced builder's good judgment can exactly determine how best to act and proceed.

It might be added here that book knowledge of this subject is of very little assistance to anyone who has to actually direct or supervise this branch of building work; only common sense and judgment are needed. The foreman or superintendent should not do any work himself, but direct and supervise it, proceeding slowly and cautiously, with the proper placing and securing of the supporting members, testing each when set so as to be assured of its perfect security and purpose of fully and safely supporting the super-imposed loads which they will be required to carry.


Fig. 6—Different forms of jacks. Top illustration shows jack screw. Center illustration shows a pump screw. Lower illustration showing operation of a borizontal pump screw.

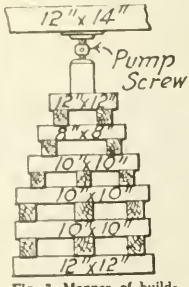


Fig. 7—Manner of building up the stacks of blocking previous to moving a building.

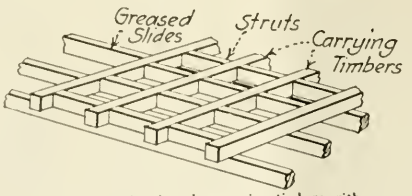


Fig. 8—Method of bracing the carrying timbers with struts under a building to be moved.

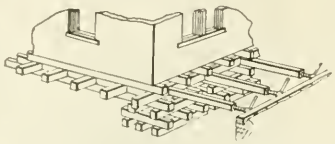


Fig. 9—Manner of bracing the blocking with horizontal screws to start the moving of building.

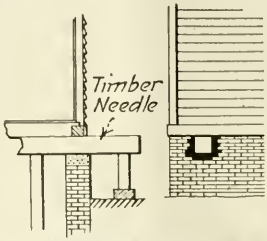


Fig. 10—Portion of underpinning of house showing needle hole in wall and the manner in which the shores are placed.

By a simple remodeling scheme more floor and window space was obtained in a store and a new front installed that modernized its character. To do this, old cast iron columns and horizontal cast iron lintels had to be removed, these being replaced by three 12-inch steel I-beams supported by end piers.

Figure 5 shows in detail the method of procedure. Three needles with their accompanying shores were needed to temporarily hold in position the three 12-inch brick piers A—B—C of the second story. The new I-beam girders were supported by the two side walls F and G, thus giving the clear span necessary for the larger show windows.

A feature of the construction that must be seen to when doing overhauling, is the location of the joists. If the second floor beams are laid parallel to the front wall with their ends resting on the side walls, F and G, then no interior shoring work will be needed. Should they run fore and aft, and have their ends resting on the front wall, then they must have temporary plates and uprights erected under them to keep the tier of floor beams from sagging or dropping when the front wall is being changed; then the beam ends must be cut or blocked up as the case may be to suit the new girder arrangement.

Now regarding the material and workmanship requisite in this important branch of building operation. It must be impressed on all doing this kind of work that every piece of timber and steel, if not of the best quality, must be absolutely safe and reliable. All timbers must be straight grained and free from large knots, shakes, splits, wens and sap, always stronger than strong enough. These remarks apply likewise to all tackle blocks, bolts, etc., that are used. There should not be any uncertainty in the placing of shores or needles where they are required. Steel or timber needles, must be set level so as to carry on every point of the bearing area. Ends sawn square so they will bear on every inch. Wedges must be driven so as to be tight and not yield to another blow. Material need not be new as long as it is sound and safe.

There is always an element of danger present in remodelings and alterations, which care and caution only can guard against, therefore it behooves those men to make sure that all is carried perfectly safe and secure, before commencing to remove or weaken any bearing construction.

In many locations a special permit is required for the removing or alterations of buildings. There is great danger to adjoining structures in built up portions of cities. All of this, of course, must be carefully guarded against, but when a man is careful and knows what he is doing there is no danger.

In moving buildings there are many special appliances such as rollers, special jacks, tackle, etc., that really make the operation far easier than it looks. Many contractors that are equipped with these special appliances find out that they are able to take on many a profitable job.

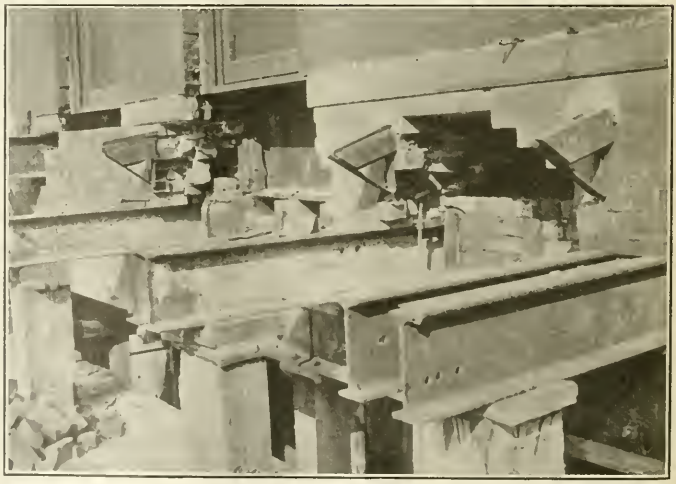


Fig. 11—The use of old steel I-beams is recommended for needles This photo shows their use in remodelling a store front. The new steel girders are already in place and the new supporting brick work is ready to be built upon the new girder.

Specification *for* Electric Wiring

ONE thing that is always up to the general contractor is the advising of the owner about the electric wiring. Before making out sub-contracts, it will be necessary to give the electrical sub-contractor a specification of what is desired, and the form given here is a model which was prepared by The Frank Adams Electric Company of St. Louis.

General Conditions

The electrical work will be sublet, but all of the conditions of the general building specifications must be considered as a part of the specifications for this section of the construction.

The contractor's bid must be based upon the complete specifications and plans with all materials as specified. He may, however, make an alternate for other material with his price either higher or lower than for the material as specified. No changes will be considered after the contract is let.

All material used in this installation must show the Underwriters' Laboratories' label, unless that entire classification of material is not in the label service, when it must be listed in the Underwriters' Laboratories' approved list of material. The entire installation must be made according to the National Electrical Code standard, and the Inspection Department having jurisdiction must be asked to make their inspection based on these specifications and the accompanying plans. This specification does not include the furnishing or installing of fixtures or lamps.

Service Entrance

The service entrance (in overhead) must not be less than 15 feet from the ground, and the feeder conduit must be equipped with an approved service conduit Type DRF or equal, and have feeder cables extend through the conduit three feet.

Main Service Feeder

From service entrance condulet install conduit and cables to the service switch, install conduit concealed, and make feeders of ample capacity for outlets shown on plans, and with the number of cables to conform with the Lighting Company's feeder system that will connect to this building. Conduit must be galvanized.

Service Entrance Switch and Meter

Where marked on plans in basement and in such a position that the meter can be read through the basement entrance door, place an externally operated service switch of full capacity of feeder and with meter test links and meter trim for the proper sized meter that will be used in this installation.

House Feeder

From service switch and meter continue the same size of feeder in iron conduit to the distributing center as located on plans on second floor.

Electric Range

If an outlet for electric range is installed, then install, either above or alongside of meter, two externally operated switches, one of the full capacity for electric range (having a capacity of not less than three No. 6 cables), and the other full capacity of house feeder, and connect the house feeder to this switch and extend in conduit three No. 6 wires from the range feeder switch to an outlet not less than four feet above the floor, and convenient for connecting to electric range. At this point a special condulet must be furnished.

Distributing Center

Where located on second floor plan, and about five feet to center, place one, standardized safety type panelboard, having a sufficient number of branches to take care of all circuits to outlets for lighting fixture, universal duplex receptacles and hanger outlets, no circuit capacity to exceed 660 watts and for a separate branch circuit for each of the heat and power outlets in each bath room, one in kitchen, laundry, and also spare branch for additional circuit.

Circuit Wiring

All branch circuit wiring must be done under the classification of knob and tube work, with conduit for those outlets and switches installed on brick walls. Wire and cable must be of approved make.

Outlets

All outlets for ceiling fixtures and brackets must be equipped with outlet box and finished with standardized fixture stud.

All switch outlets must be fitted with standard switch box and equipped with single pole flush tumbler switch with plate finished to match surrounding hardware. Wherever more than one switch is located at the same place, they must be located in gang boxes and plates.

There will be separate three-way switches as follows:

For the furnace light in basement with switch on first floor and basement; rear stair lights on second and third floor with three-way switches on first, second and third floors; second floor ceiling lights with three-way switches on the first and second floors; light in reception hall with three-way switch on first and second floors.

Baseboard Receptacle

At each plugging outlet as located on plans, furnish Duplex Universal Receptacle. Locate this in the center of flat space of base board.

Hanger Outlets

At all outlets so marked furnish hanger outlets 7 feet from floor. These outlets must be complete and securely fastened to studs of partition or into brick walls, so as to support either fan, heater, or a picture with lights.

Heat and Power Outlets

At all heat and power outlets place 4 feet from floor an outlet consisting of outlet box and one plate with double pole 20 amp. switch, signal lamp, and 20 amp. standard receptacle and plug.

Inspection

The contractor must notify in writing the inspection department having jurisdiction, and notify them that the specifications call for the inspection department to base their inspection on both the specifications and accompanying plans, and that the certificate for the completed job must particularly signify that the inspection has been made according to plans and specifications. The contractor is to pay the fee for the inspection certificate.



Sound Proof Partitions Feature this Modern Apartment

ROUSE & GOLDSTONE,
Architects

IT is rather interesting to note the different floor arrangements made for the modern apartment house. The design shown here is that of a thirteen-story apartment house located at and known as 25 Fifth Avenue, New York City.

In smaller cities apartment houses with practically the same room arrangements can be built two or three stories high, as there are some special features that commend itself to both a large or small apartment building. Each floor contains seven separate apartments.

The way the house is divided it is practically two separate buildings. One entrance on one street and another around the corner. In the one section there are three three-room apartments and one four-room apartment, and on the other side there is one four-room, one five-room and one six-room. Both sides are served with individual elevators, both passenger and service. Each apartment, of course, has a bathroom, and one apartment on each floor has two bathrooms.

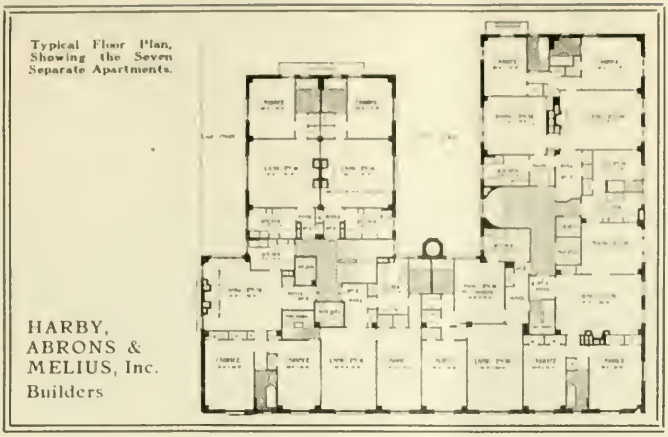
Of course, this building is of fireproof construction throughout, being built with a steel skeleton.

One of the bad features of apartment house living is the fact that one too frequently hears the talking, etc., of the people in the adjoining apartments. The architects and builders of this apartment house have solved this problem in a very effective way and still have a very thin dividing partition that has completely deadened the transmission of any sound from one apartment to the other.

The partitions in this particular house are only three inches thick and the saving of space that this provides figures up to be quite an item where rental is figured at so much per square foot.

Tenants have rebelled against apartments where they hear every noise made by their neighbors and where their own conversation may be heard by others. Tenants will not remain in a noisy apartment when they can rent one at equal rental that has the added advantage of deadened floors and partitions. A sound proof partition assures more permanent tenants, therefore, it is an actual economy for builders to make their partitions and floors thoroughly sound proof.

The particular method used in this building is shown by the illustration. Wires were suspended from the concrete ceiling and attached to the concrete floor. These were pulled taut and an eel grass sheathing quilt fastened between these, then gypsum plaster boards were placed on each side and fastened with clips through the wires and over the board, then the plaster coat is applied on each side to make the finished wall. No other lath or studs were used. The result was a fireproof partition that also possesses the desirable property of being soundproof combined with ability to get it in a three-inch space.



Typical Floor Plan, Showing the Seven Separate Apartments.

HARBY, ABRONS & MELIUS, Inc.
Builders

the exact temperature desired, and the mechanism brings the room to this degree of heat and keeps it there. This is obviously a great improvement upon the common method of rapping on the pipes for more heat or scolding the superintendent over the telephone.

The elevator systems of the newest apartments have been greatly improved. In some of the most expensive modern houses an apartment may have a private elevator for its own exclusive use. The small automatic electric elevator is also becoming more common. It is summoned to any floor by merely touching a button and can be carried to any desired floor by pressing other buttons, and is so controlled by automatic devices as to be perfectly safe and fool-proof.

American apartments readily lead the world today in the completeness of their mechanical equipment. The best engineering skill is constantly busied with new devices which will raise our standards of comfort and luxury. The decorations of high-class apartments in London and Paris may rival our own, but the equipments which make for comfort are distinctly inferior.

The evolution of the apartment is, besides, very rapid. Every new apartment house strives to outclass its predecessors. Although the war seriously checked most building it does not seem to have interfered with the development of labor-saving devices.

The mechanical devices which reduce the drudgery of housekeeping soon become the property of all. The housekeeper reads today of some new equipment in a twenty-five-thousand-dollar-a-year apartment, and tomorrow or the next renting season demanding it in the moderate-priced flat.

A few years ago the icebox and the dumbwaiter were considered luxuries; today they are the necessities of the cheapest flat. By studying the newest equipment of the most costly apartments it is possible to prophesy the features of the cheaper flats of the near future.

The heating of an apartment need no longer be left to the caprice of the janitor or superintendent. The heat supply may be controlled entirely by a thermostat. It is only necessary to push the indicator of the dial to



Gas and Electric Heating *for* Dwelling Houses

How Easily Operated Systems Without the Dirt and Work of Coal May be Installed by Builders in Modern Homes

By CHARLES L. HUBBARD, M. E.

OWING to the present scarcity and high cost of coal it may be well to give some thought to gas heating both as an auxiliary and for regular service.

There are two ways of using gas for auxiliary work, one by means of portable heaters placed in the rooms to be warmed, and another in which a supplementary heater is attached to the regular system for the purpose of operating it at a reduced capacity before a fire is started in the furnace or boiler.

Portable heaters are of two general types, those in which the heat is given out directly from the flame and from hot surfaces of metal, fire clay, asbestos, etc., made in imitation of stoves and fire places; and those in which the gas is made to heat water or generate steam, which circulates through a direct radiator of the usual form, as shown in Fig. 1.

The first type is more easily moved about from room to room, being connected with an ordinary gas jet by means of a flexible tube.

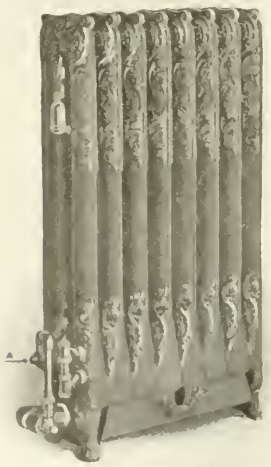


Fig. 1. Gas-Steam Radiator

Gas heaters of the radiator type are portable to the extent that they may be moved, but are connected with the gas system by iron piping and are usually a permanent fixture during the heating season. In some cases they form a part of the regular heating system, being so cross connected that they may be operated either on gas independently before the boiler is started up, or on the main system during the winter.

Gas heaters are very convenient for use in special rooms where heat is required temporarily, also for moderate warming during the spring and fall when the regular system is not in use, and also in helping out on very cold days in the case of certain rooms which do not heat properly in extreme weather. Gas heaters vary in capacity according to size and form and their rating should be obtained from the manufacturers. In the case of small units, the products of combustion are allowed to pass into the room, but for larger sizes a vent pipe should be provided, leading to a chimney flue, out of doors, or into a well ventilated attic.

Gas-steam or water radiators are especially adapted to the warming of rooms which have been finished or added after the house has been completed, and are not easily connected with the main heating system. This applies especially to bedrooms and similar spaces where heat is not required continuously.

A gas heater arranged for auxiliary work in connection with a system of hot-water heating, is shown in diagram in Fig. 2. This is for use when it is desired to warm up a considerable portion of the house, or furnish heat for a short time night and morning or before the boiler is started.

When it is desired to heat only one or two rooms, the portable type is more economical, but for a more general distribution of heat it is better to make use of the regular system of pipes and radiators, shutting off such rooms as are not to be occupied.

Instantaneous gas heaters of the type used for water heating in bath rooms, etc., may be employed for this purpose, provided the water passage through them is not too restricted. Heaters of this type are commonly rated in gallons of water per hour through a given temperature range. When used for house heating purposes the capacity will be considerably reduced owing to the lower velocity of water through coil and its higher average temperature.

A heater rated at 1 gallon per minute, raised through 100 degrees, will furnish $100 \times 83 = 830$ thermal units per minute or $230 \times 60 = 49{,}800$ per hour.

Probably under the conditions shown in Fig. 2 not more than one-

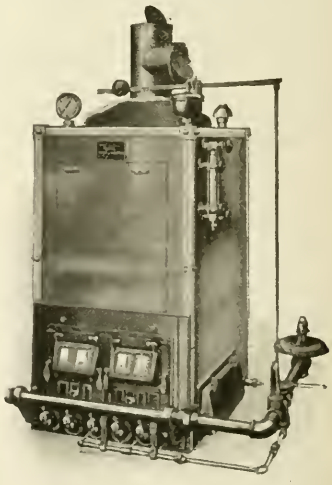


Fig. 3 Gas Fired Boiler

fifth of this, or 10,000 thermal units would be realized, or sufficient to supply about 10,000 ÷ 170 = 60 square feet of direct radiation.

The above assumption is made on the basis of a water velocity of 400 feet per minute through the heating coil when used according to its normal rating, and only 25 feet per minute when used as in Fig. 2.

Recently, special gas boilers have been placed on the market as a substitute for coal burning boilers, one of these being shown in Fig. 3. While they have been confined principally to the natural gas regions, the present high cost of coal and labor makes them worth investigating in connection with regular heating work in other sections.

As a matter of comparison, we may assume that one pound of anthracite coal contains 13,000 thermal units, which is 13,000×2,000 = 26,000,000 per ton. If a moderate size house heating boiler is operated at 55 per cent efficiency, and coal costs $15.00 per ton, then the cost per 1,000 thermal units will be as follows:

$$\frac{\$15.00 \times 1{,}000}{26{,}000{,}000 \times 55\%} = \$0.00105$$

Gas boilers have a higher efficiency than coal boilers and we may safely assume about 80 per cent. for the best designs. Assuming the thermal value of manufactured gas as 650 thermal units per cubic foot, and the cost $1.30 per 1,000 feet, the cost per 1,000 thermal units will be

$$\frac{\$1.30 \times 1{,}000}{650 \times 1{,}000 \times 80\%} = \$0.0025$$

or 0.0025 ÷ 0.00105 = 2.4 times the cost of coal for the assumed conditions.

While, at first thought, this might seem to be strongly in favor of coal, it must be borne in mind that the above is for continuous operation, as during the winter months in the northern states. During the spring and fall, or for winter heating in the southern states, the demand for heat is intermittent, and the excess cost of gas over coal is greatly reduced, or may entirely disappear. A gas burning equipment may be regulated to meet every condition automatically without reducing the efficiency. With coal this is not possible to such an extent and the efficiency falls off rapidly with a reduction below the normal rating for which the boiler was designed. Furthermore, if the fire gets low or goes out entirely, a large amount of heat is wasted when it is brought up again.

In the case of individual gas heaters the efficiency is close to 100 per cent., because practically all of the heat of combustion goes into the room in one form or another and is therefore utilized.

In a case recently reported an actual saving was made in a New York City dwelling house ordinarily burning about 15 tons of coal per season, by changing over to gas at current prices. While the cost of fuel was more in the case of gas, the reduction in labor brought the actual cost of heating down to about 9 per cent. below that when coal was used.

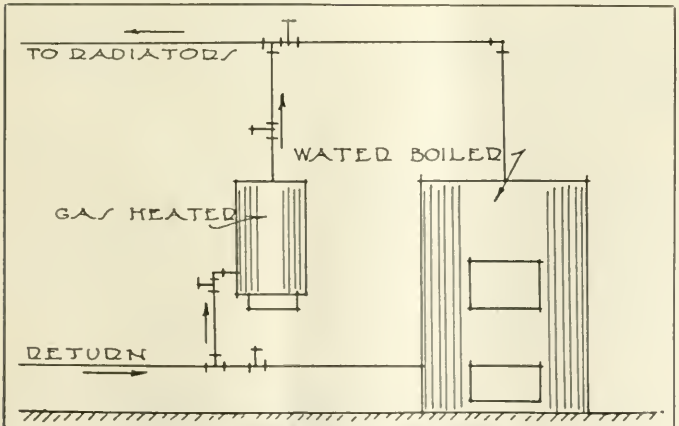
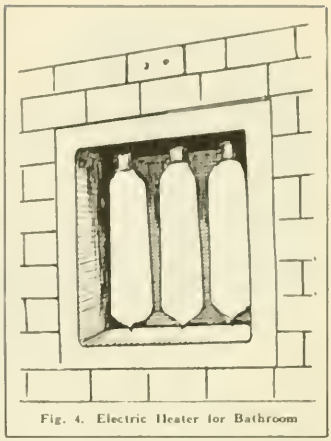


Fig. 2. Gas Heater Arranged for Auxiliary Heating


Fig. 4. Electric Heater for Bathroom

Electric heating is used in much the same way as gas, that is, for supplementing the regular heating in special rooms when additional heat is required only for short periods. Electric heat, however, is much more expensive than either that generated directly from gas or coal, and is not a practical method for permanent use, except in certain cases where current may be obtained at an exceptionally low rate from large hydro-electric plants in regions where coal is particularly expensive.

When the electricity must be generated by steam power the cost of heat in this form will run from 10 to 20 times that furnished directly from the steam. In some cases, however, the fuel cost alone may not be the deciding factor and electricity may prove more desirable for other reasons. The substitution of electric heat, purchased from a power company, will often reduce the cost of labor, while the greater convenience, cleanliness, and saving in space may also have a money value. However, this excessive cost practically disposes of the question of heating entire buildings by electricity except under some of the unusual conditions noted above.



CARPENTRY

Good Practice in Frame Construction and Finish

Some Difficult Problems Made Easy

Short Cuts from a Builder's Note Book

By JOHN PARKHILL

YEARS ago fourteen carpenters were directed to place cross braces on the posts of a long inclined trestle, as shown in Fig. 1. Each set of posts being a different height; of course, each pair of braces had a different length and cut.

Some of the men spiked these braces up and cut the ends afterwards, which was rather difficult, as indicated by the illustration. Some put them up, marked, and took them down, then cut them, and again put them up—permanently.

By using the rule here given, two of us found that we could easily accomplish from fifty to sixty-five per cent. more than any other two.

As an example, take Fig. 1, which shows the brace extending twelve feet horizontally, and sixteen feet perpendicularly. Take the hypothenuse of these—from A to B—which is twenty feet, and mark this distance from A at one edge, to B at the opposite edge of the plank.

Place the square with sixteen on it (the height), at A, and twelve (the width), on a straight line joining A B, and mark from A across plank; and the same cut across from B. This gives cuts and length of brace. Using any other width and height, and their corresponding hypothenuse, in the same manner, will give the cuts and length.

The writer originated this rule for this trestle, and over thirty years' investigation has failed to disclose any previous knowledge of it.

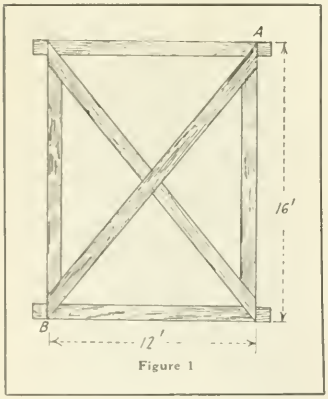


Figure 1

Cut of Hip Rafters

In 1910, when the Professor of Carpentry at one of our foremost state universities was demonstrating to the students the roof framing for a barn, he found himself unable to mark a certain cut. This is the cut on the projecting end of the hip rafter which corresponds with a square cut on the projecting ends of the common rafters.

He told me that after searching through all the building magazines and libraries in the United States to which he had access, he had failed to find a rule for this cut, and asked me whether I could furnish one. After some study I sent him the following:

From any straight edge mark the horizontal cut of the hip rafter. Divide 144 by the rise, and thus get another rise for a second pitch.

Marking the horizontal cut of the hip for this second pitch across that of the first hip, as shown in Fig. 2, gives the desired cut.

In Fig. 2, this cut is shown marked on the end of a hip for a pitch of nine inches rise to one

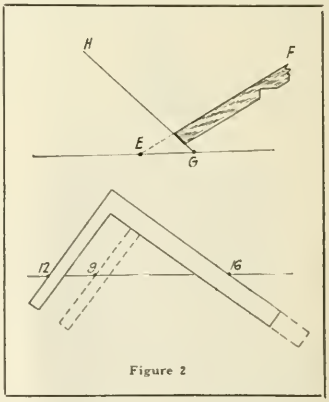


Figure 2

How to Use the Steel Square to Obtain the Proper Lengths and



Cuts for the Diagonal Braces Shown Above in Figure 1.

foot—E F being the horizontal cut of this hip.

Then, 144 divided by the rise—nine—gives 16 as the rise for the second pitch, and G H is the horizontal cut of the hip for this second pitch, and gives the desired end cut on the first hip.

If the operator is unfamiliar with arithmetic, even this slight use of it—dividing 144 by nine—may be avoided, if desired, by marking the horizontal cut of common rafter—with a run of twelve, and a rise of nine—and slide the square along on this cut to a rise of twelve, which will give a run of sixteen. This run (16) for a 12 inch rise on common rafter is the rise for the second pitch, and, of course, is identical with 144 divided by nine.

To forestall any question regarding the result of the professor's search, perhaps it should be admitted here that one book on roof framing did purport to give a rule for this cut, but the "rule" was so totally wrong, that a square cut would be much nearer right—for a majority of pitches. And even if this "rule" is tested on all possible pitches—hundreds—or thousands—of them, it happens to be right for one pitch, and for one ONLY.

Siding Circular Buildings

Occasionally carpenters are required to side up circular buildings with thin lapped siding, and oftener than occasionally the result is a bungling job. And yet this need not seem so surprising, since it is simply impossible to bend a straight piece of this siding around on a level, without kerfing it. And kerfing is not usually permissible. Advising the workman to search for, and use, siding which is warped edgewise, gives him mighty little help, as he will do more searching than siding.

He can make a perfect job by cutting curved siding from wider boards, using the radius J K in Fig. 3, for the conditions there shown. If lines coinciding with the face of the siding were extended as shown, K is the point where they converge.

In Fig. 3, the diameter of the building is ten feet, and we find that in a width of 4½ inches the siding inclines one-half inch from the perpendicular. There are 120 half inches in half the diameter, so it will require 120x4½ equal to 540 inches, or 45 feet, to reach from J to K. Siding cut with a radius of 45 feet will bend around this building perfectly level.

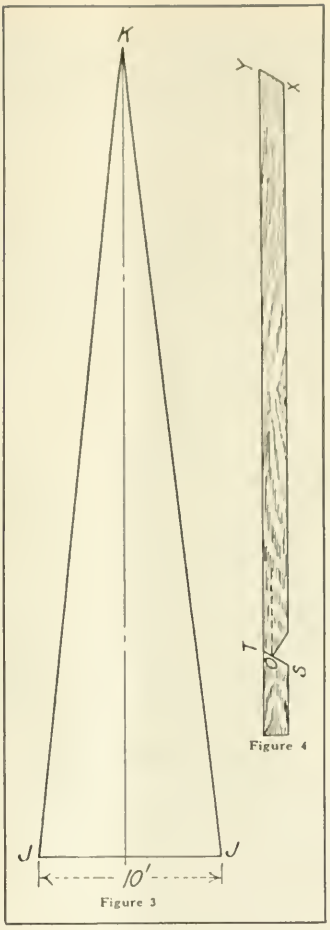


Figure 3

Figure 4

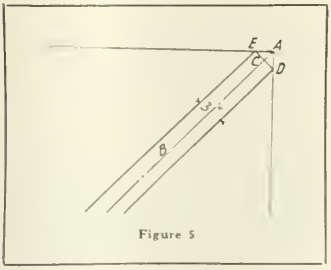


Figure 5

Kerfing a Crown Mould

After having tried it and failed, many competent builders have declared that it is impossible to kerf a crown moulding so that it will bend level around a circular plumb fascia. And yet they are quite mistaken, as this can easily be done by simply keeping the tooth edge of the saw parallel to the plumb side of the moulding when cutting the kerf. Cutting this kerf—or practically most any kerf—on a bevel, will give a much more satisfactory job.

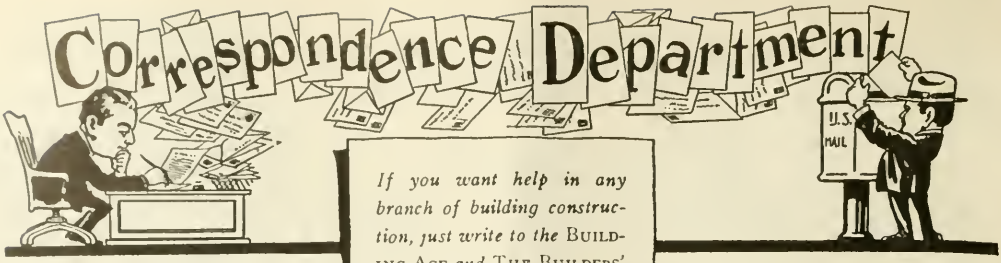
A Roof Framing Myth

What is now a hoary old myth was long ago perpetrated by some muddle-headed builder, and has been perpetuated ever since by roof-framers who shirk much thinking—as most of us do. The author of a most pretentious treatise on roof-framing expresses this myth in these words: "As the lower end of the rafter is notched to sit on the plate, we *must* gauge off a backing line as shown, to run in to the angle of the notch."

It would be equally true—and equally false—to tell us that we *must* use the rise and run of a hip rafter to get its length. We don't. *Must* is wrong in both cases. No backing line is required, and the attempt to use one only complicates and confuses the problem, and in many cases leads to error. My practice and teaching has always been to mark the length of a rafter between two plumb marks, as shown by S T and X Y in Fig. 4. Then S X or T Y is the length of rafter, regardless of whether the horizontal cut is marked from T or from any point in T S, as for instance, O. Thus a gauge line from O is quite unnecessary—and worse.

No subject in the carpentry line is so interesting as the laying out of roofs—it makes a fellow use his head quite a bit.

There have been instances where some one blundered and the roof was so nicely built that it all had to come down. They sure were a sore lot of carpenters, not to say anything about a mad boss.



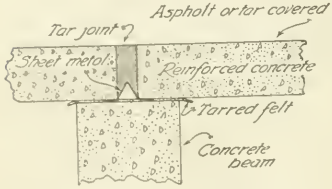
If you want help in any branch of building construction, just write to the BUILDING AGE *and* THE BUILDERS' JOURNAL *Correspondence Department. We will be glad to answer all your questions without charge.*

All readers are invited to discuss the questions and answers published.

Laying Concrete Roofing

FOR several reasons, concrete makes an admirable roofing material. This is especially to be desired when the building is of monolithic construction. Yet the massiveness and the natural tendency to expand and contract with the changes in temperature gives it its one fault. It cracks when laid over large areas, even though ample reinforcing has been provided.

For this reason it is better to cast the concrete in slabs and to lay them with expansion joints. When these joints are laid over the supports such as the posts or reinforced beams, an ideal roofing material has been secured.



In the drawing is shown such a joint. The slabs, precast and of a size to match closely, are laid with the joints over the supports, with approximately one inch space between. A strip of metal sheeting is bent into a deep "V" shape and laid upside down with each edge under the adjoining edges of the slabs.

The top of the support should be covered with tar paper so that the slabs will move as much as is necessary and with a minimum amount of friction.

After the slabs have been laid and it is assured that surfaces are dry, fill the joints with hot tar or asphalt, first painting the ends of the slabs with an extremely hot mixture to insure a good bond between the two materials. Then a thinner coat is given to the whole of the top.

In this way the whole top is made water tight, and yet provision has been made for the expanding and contracting which cannot be prevented. If the top slopes slightly, drainage will be easy.—**Dale Van Horn.**

Pound for Lost Children

EVER so often the builders employed by the great American municipalities are called upon to erect this, that or the other unique structure—large or small, or medium-sized; seldom, however, any more actually-unique than that which was completed recently for the good park commissioners of the city of Milwaukee.

Ever so often a youngster will stray away, and when he or she is discovered by the park policeman, sobbing violently for Mother, Daddy or some careless nurse girl, there has been—up to the moment of erecting this enclosure—no way of knowing where the searcher for the mischievous stray child might, in due time, be found. Police went in one direction, parents in another, etc.

So the park officials took counsel over the matter. Then they conferred with the park builders. The result is a very neat and really attractive pound at the big park's heart, reserved for lost children, and to which, as everyone in Milwaukee now knows, all lost children should be brought as soon as found.—**Felix J. Koch.**

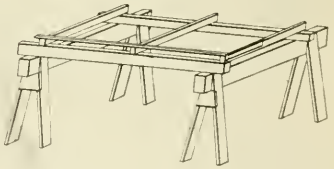


Lathing Kink

CARPENTERS when nailing wooden laths on a wall spend unnecessary time in holding the lath in position with their left forearm and elbow, taking a nail from pocket or mouth and putting it in position between the left thumb and finger and holding it there while they drive it home with the chance of pounding one's fingers with the accompanying expenditure of useless profanity.

I had a rush job of plastering and devised the following scheme which saved considerable time and will appeal to any efficiency expert.

Nail three strips of 1 in. x 2 in. x 36 in. Y. P. to two 2 in. x 4 in. x 36 in. Y.



P. scantlings so that the strips will be the same distance center to center as the furring strips on the wall. Place the frame thus made upon two trestles or other means of support. Place a pile of laths on the strips and a box of nails within easy reach, using the strips as gauge lines and anvils, drive nails into the lath until the points project through, then lay aside. Strips may be nailed on the end and front to act as stops or guides. A dozen laths may be laid edge to edge and nailed at one time.

The carpenter simply takes a lath in his left hand, holds it in position and with a few taps of the hammer nails it in place.—**Henry R. Bowman.**

Wire for Bridging

MY attention having been directed to the article "Use of Wire for Bridging" Page 49 of the August issue of BUILDING AGE AND THE BUILDERS' JOURNAL, I have read it with much interest.

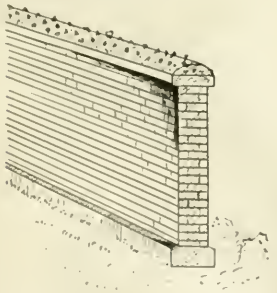
Undoubtedly, the idea must surely have been conceived by a former service man, familiar with the many uses which wire was put to, during the World War. Of its originality and simplicity there is no question, but is it practical?

You are aware, as expert architects and building contractors are, that while wire stretches in length, lumber shrinks in width (dampness excluded). Such being the case, you arrive at no other conclusion but that wire for bridging purposes, cannot compare favorably with wood.

I question very much if any competent architect would specify wire for bridging, where the joists are eight inches, or over.—**Joshua Thompson.**

Glass Topped Wall Gives Protection

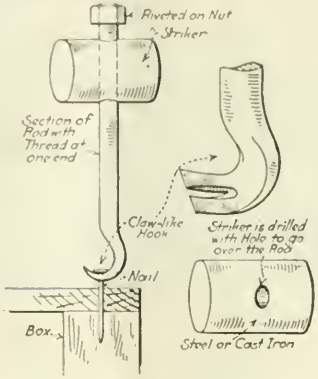
THE high brick wall erected about a suburban home adjacent to Washington, as a protection mainly against burglars and animals, did not meet the requirements so the owner decided upon an additional safeguard to the wall, made up of cement and glass. This consists of a quantity of jagged glass projections, imbedded in the cement while plastic and held solidly when the cement became hard. The cement was rounded out with a high crown so that the sharp glass would be at the uppermost edge and consequently unsafe to attempt to cross, because anyone could not obtain a safe foot or hand hold.



Another protection which this affords, is against cats using this fence for nightly meetings, which is a creditable feature in the prevention of this nuisance. In appearance, the glass does not appear as a disfigurement, rather, the various shades of green blue, red, brown and other tinted glass which are mainly broken bottles and window panes, glisten and bead in the sunshine almost as though they were jewels. Glass evidently was selected in preference to metals inasmuch as it is proof against corrosion, and the sharp edges would remain sharp indefinitely.—**George A. Luers.**

Easily Made Nail Puller

THE nail puller shown in the attached sketch combines, with a hook for starting the nail, a striker for driving it out. The tool is made from a length of bar, threaded at one end and forged to a slotted "V" hook at the other. For a striker any heavy piece of iron or steel with a hole through the center to slide on the rod is provided. As shown in the sketch, this is a piece of shaft end. The manner of using the tool is obvious. For uncrating or opening boxes this tool will pull out the nails rapidly without bending them or breaking the box. The nut should be riveted on the end of the shaft, to avoid the parts being separated.—**W. A. L.**

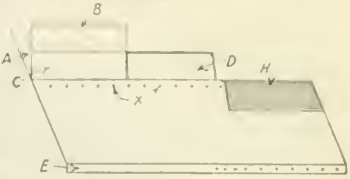


Bed Moulding in Angles

WORKMEN experience difficulty in "running" bed moulding in the angle of an eave cornice. The subject is here presented in figure 1 and shows the mould tipped out of plumb so as to intersect properly with the same member on the gable end.

This looks all right until the job of nailing this tipped member in this position without shifting or splitting is attempted and then the difficulty attending this operation makes the job impractical, though generally done in that way.

This job can be done to some advantage by setting the bed plumb, turning the corner continuing on a level line as shown on figure 2; cap this return and tinflash the caps. The finished job is more quickly done, looks better, is more substantial and conserves the wear and tear of workmen's dispositions.—**C. A. Doner.**



Leakage at Wall Plate

WAY back in the 80's of the 19th Century, when actual two or more storied business buildings commenced taking the place of "false fronts" in our town, they were usually covered with tin or iron (painted) standing seam roofing. We then experienced a great deal of trouble from leakage a few feet in from the back wall or eave, especially from iron roofs, as they were not double seamed like the tin roofs.

As a remedy, the metal was taken up over the rusted portions and renewed after the pitch of the last set of roof joist had been increased. The connection of the old roof with the new material was made as illustrated.

The seams of the old roof was flattened down, up the roof from the eave as far as necessary to get back of all unsound metal. A chalk line drawn across the roof at this location and the old roof sheared away from this line. The ends of the seam thus brought out are hammered very flat and close for two inches from the end, then graduated with a twist or spiral from the flat end to the regular perpendicular seam of the roof. This flattened end is then framed straight up an inch with tongs (as at B). Measurement is taken from the eave E to the flange B, to this is added ½ inch for the flange C to engage the flange B. Also 1 inch for forming over the eave for nailing. Where formed and fitted into place the new metal is nailed along its entire length as shown at X. The top of the flange B is then formed over C, giving the seam D, where the whole length of the seam is hammered down smooth and tight for soldering if the metal used can be soldered.—**L. S. Bonbrake.**



Figure 1

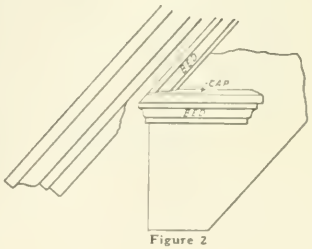


Figure 2

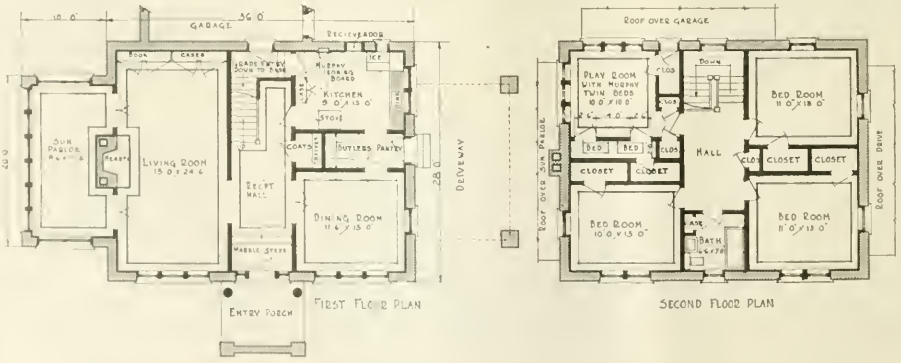


Brick Home of Beauty

HERE is a design for a comfortable Seven Room Home, built of brick, that is dignified and not too ornate.

There are many desirable features to this design. Perhaps the one that will appeal is the large sun parlor. This opens into the living room through two pairs of French doors. The glassed-in portion of this porch is in the shape of doors which are easily removed and replaced by screens for summer use. The sink in the kitchen is placed directly under a double mullion window, assuring plenty of light, and the refrigerator is iced from the outside. Milk, etc., is delivered inside the kitchen by an automatic lock raising door. At the rear, a garage has been built and this may be entered from the kitchen.

This home of beauty is the residence of Mr. and Mrs. H. W. Krause, of Indianapolis. Mrs. Krause had her own ideas of what she wanted and they are embodied in this convenient home. The plans were drawn by Mr. S. P. Seycrest, of H. M. Glossbrenner Realty Company, of Indianapolis, Indiana, who were the building contractors.



What the Editor Thinks

The Close of a Prosperous Year

THIS month brings the year 1922 to a close and everyone in the building industry has reason to be thankful that they have had such a prosperous year.

More building has been accomplished than in any other previous year of the history of the United States, and it is with great satisfaction that builders can survey the work that they have done as they realize that this work has been something that will add to the permanent wealth of the country and the happiness of quite a large number of families.

The man that owns his own home is a better citizen all around than one that simply rents a few rooms and it is by builders preaching this gospel of owning your own home that has made many to want and strive to build a home of their own.

There is certainly satisfaction in doing a good piece of work where it benefits yourself, your customer and your country.

Index for 1922

WE have in preparation an alphabetical index of the contents of BUILDING AGE and THE BUILDERS' JOURNAL for the year 1922. This we expect will be ready towards the end of December, and a copy will be gladly sent without charge to any reader asking for same. A postal card request will be sufficient.

Our Cover Design

OUR homes have more or less of the delightful appearance in the summer time when trees are in leaf, the grass is green, the flowers in bloom and the sky a glorious background to all.

In the winter time, however, with the barren trees, the snow-covered ground and the bleak sky, it is then that a house should have a welcome look, reflecting warmth and coziness within, together with good cheer.

What could be truly more delightful than the pleasing design shown on our cover this month, on a cold December night, radiating its Christmas cheer to all without.

This house is the residence of Mrs. C. W. Sullivan and was built at Merion, Pa., and Messrs. Savery, Sheetz & Savery of Philadelphia were the architects.

The floor plans of this house were published in our issue of March, 1921, but here we show how the same house appears in the winter time.

Lack of Skilled Mechanics

MANY manufacturers are concerned on the effect the shortage of skilled mechanics in the building trade will have on the sale of their products. At the present time there is a big demand for buildings, more than the normal average, due to construction having been virtually stopped during the war period.

No more brick, timber, plumbing supplies, paint, etc., can be used than there are mechanics to erect and install them. It certainly is regrettable that no concerted action is taken to remedy this situation. Many earnest efforts have been put in operation and have been successful in turning out young men with some knowledge of their rudiments of particular trades.

Builders to Conduct Building Show

BUILDERS Exchange of Pittsburgh, propose to hold a building exposition in their city early next Spring. They feel that a show of this sort properly conducted by men vitally interested in the building industry will greatly aid it and promote home building to quite a considerable extent. Here is a step in the right direction—it is a good example of co-operative advertising that will result for the good of all.

The High Cost of New Men

ONE of the best arguments for winter work is that it keeps a contractor's organization together. To have a group of men about you that know exactly what you want is worth money to you. There is no time lost and no costly mistakes made.

This, of course, is so with skilled workers, but it is even more so with common labor. The cost of breaking in a new man must be charged to overhead, and it is for this particular reason that an employer should hesitate a long while before firing anyone, as he knows it will be an expensive thing for him to do so.

A little more time spent in the selection of men would be worth the trouble. Pick out good men—those who will stick. Wherever possible, hold on to your men during the winter season, so that they will be with you when the spring rush comes again. Most men, especially in small towns, welcome a few weeks off so that they can do necessary repairs around their own house and this helps out the small town contractor to quite an extent.

Poor Concrete Blocks

BUILDERS in buying concrete blocks that are made by some small manufacturer in their locality should be a little careful to see that they get a good product. Too often a man starting to manufacture blocks does so because he has a little piece of land on which a good grade of sand has been discovered and he buys himself a block machine and starts in the business.

Owing to ignorance of their proper manufacture, they are weak in crushing strength, apt to crumble, crack and absorb excessive moisture. It is a wise thing for a builder to make his own blocks unless he can assure himself that the manufactured blocks are up to the proper mark. The result of using poor blocks is that everyone gets more or less of a black eye excepting the guilty manufacturer.



Legal Department

SPECIFYING with as much particularity as is reasonably possible is important when the work is to be done by a sub-contractor. An interesting decision is found in the opinion of the Washington Supreme Court in the case of Washington Monumental & Cut Stone Co. vs. Murphy, 142 Pacific Reporter, 665.

Bulkheads as Part of "Steps" in Stone Sub-contracts

Defendant had the principal contract to erect a high school building, and awarded plaintiff a sub-contract to furnish "granite steps and platforms and the two granite courses around the building as shown," etc. Controversy afterwards arose as to whether plaintiff was bound to provide the bulkheads flanking the steps and platforms. The court finds that no such requirement existed, especially in view of expert testimony tending to show that it was customary to construct bulkheads of the material used in the wall of the building on which they abut, and that it was not customary to require a sub-contractor to construct them under such a contract. The court said, in part:

"The contract itself would hardly seem ambiguous, since, by particularizing the things included: steps, platforms, and courses, it excluded all things not enumerated. If the word 'steps' was used in some broad generic sense, as including everything in any way related to the steps proper, so as to include the bulkhead, why use the word 'platforms' at all? They, at least, are in a sense steps, while the bulkheads are not. It is a matter of common knowledge that a platform in a stairway is, both in use and position, but a broader step or tread. A bulkhead, though sometimes employed as a balustrade, would hardly perform the office of a step in any connection. Nor is it clear that any ambiguity was imparted into the contract by its reference to the plans and specifications. An examination of the plans of the school building shows the word 'granite steps' with an arrow pointing to the steps alone, i. e., the treads. The lower base course is marked 'fine axed granite' and the upper course is marked 'stone.' A front cross section shows the legend, immediately below the upper course (which is referred to in evidence as the base mold), and above the bulkhead, ' all work below base mold to be of stone.' Even the sheet showing the details for the bulkhead, steps, and platforms fails to show that the bulkheads are to be of granite. The steps and platforms are shaded in such a way as to indicate that it was the original intention that they should be made of a different material from the bulkheads. There is nothing whatever, either in the written plans or in the specifications, which would tend to indicate that where the word 'steps' is used in the contract it should be construed in a generic or technical sense."

THE New York Tenement House Law does not require handrails on inclosed stairways leading to a cellar or basement, holds the New York Court of Appeals in the case of Cahill vs. Kleinberg, 135 Northeastern Reporter, 323.

Necessity for Handrails on Inclosed Stairways

The law requires stairways to be provided with proper "banisters and railings," and provides that new stairways leading to the cellar or basement shall be entirely inclosed by brick walls. The Appellate Division of the New York Supreme Court decided that this law required hand-railings on basement stairways, although the stairway might be inclosed. On appeal, the Court of Appeals held that this was erroneous, saying:

"It is perfectly well understood that a banister and a railing mean a balustrade, consisting of balusters or supports upon which is placed a railing. It is the common construction which we see on the outer and open edge of a stairway, and it is clear that by the legislation in question the Legislature intended that such a barrier should be placed upon the outer edge of every stairway as a protection against persons falling over said outer edge and receiving injuries. The entire purpose of the provision and of such a structure is obviated when the side of the stairway is protected by a solid wall, as was the condition in this case. While the Legislature might have provided for a handrail in the case of such a stairway as is involved in this case as a protection against slipping and falling down the stairs, it would be going too far in the processes of interpretation to hold that the language employed in this statute contemplated any such purpose, or that it might be reshaped in its meaning so as to describe a handrail affixed to a wall, instead of an ordinary banister such as is actually described in the statute."

ON an owner discovering after completion of contract construction that fraud was practiced upon him in obtaining the contract, he is liable, not for the contract price, but for the reasonable value of the work done, holds the California District Court of Appeal in the case of Fassio vs. E. L. Goldstein Co., 207 Pacific Reporter, 497. The court finds that in this case the owner's architect connived with the contractor to increase the cost of the work before the contract was let.

Contractor's Measure of Recovery for Work Done Under Contract Fraudulently Obtained

IN nearly all, if not all, of the states there exists a law known as the "statute of frauds." It requires certain contracts to be in writing. One of these classes of contracts is comprised by contracts by one person to pay the debt of another to a third person. However, the provision is held not to apply where credit is extended in the first instance on the faith of the promise. This exception is illustrated, as applied to the building industries, by the recent decision of the Alabama Supreme Court in the case of Turner vs. Lackland, 91 Southern Reporter, 877.

When Third Person's Promise to Pay Need Not Be in Writing

Plaintiff sued defendant, executor of defendant's wife's estate, on account of millwork, etc., furnished to a building owned by decedent. The vital issue in the case was whether the materials were furnished on the credit of decedent or of the credit of the contractor, one Raub.

Holding that under the evidence the jury could find that there was a promise on decedent's part to pay the bill and that the promise was not invalid under the statute of frauds, the Supreme Court says:

"Plaintiff testified to facts from which the jury might have properly inferred that Lackland, who conducted the negotiation with plaintiff, was acting therein as the authorized agent of his wife, that he (plaintiff) informed Lackland, in effect, that Raub had no credit with him, but that, if Lackland would see that he got his money, he would deliver the materials; that Lackland said that he was going to see that Raub did not get away with him and that he would see that he (plaintiff) got his money; that he would keep it out of the contract he had with Raub. From plaintiff's testimony, stated above, the jury had a right to infer that he furnished the materials on Mrs. Lackland's credit; that the promise of deceased, made by and through her husband, as her agent, was to pay her own debt in a particular way, out of a particular fund."

Responsibility for Error in Staking Out Lot

WE are asked for an opinion on the responsibility of a real estate company under the following stated circumstances: H bought a lot from the company in an Ohio city and the company's surveyor promised to survey the same. Later the surveyor stated that the lot had been staked out, and H awarded a contract to a builder for the erection of a cottage. The work was commenced Saturday, and on Sunday a visit to the site disclosed to H that the lot had not been staked out, excepting two stakes which had been placed at front corners before the sale was made. The contractor had lined the cottage up with these stakes, and the building was too far advanced to justify stopping further work. H telephoned the company drawing attention to the omission to make the promised survey, and was assured that this would be done at once. The following Sunday he again visited the site and found that new stakes had been set, but in such a way as to place the building on two lots. There was a variance of 25 feet from the old corners. Can H require the company to bear the expense of moving the cottage, considering the fact that the lot was sold with reference to the original stakes?

I am of the opinion that H has a valid claim for the expense of moving the building, although he was negligent in permitting the construction work to proceed without first getting the true corners. His statement of the case shows that he did not rely on the old stakes as showing the true corners of the lot, for he repeatedly sought to have a new survey made. But in my judgment he had a right to assume that the old stakes were substantially in correct position, so far as the real estate company is concerned. This is particularly so in view of the fact that the lot was sold to him with reference to the old stakes.

On the other hand, there are two points on which H might be defeated in a suit to recover the cost of moving the cottage. If in selling the lot the real estate company did not agree to survey the lot, its promise to do so afterwards, while morally binding, would be legally unenforceable unless there was some new consideration for the promise. Or, if the agreement to survey was a part of the contract of sale and therefore enforceable, but if the real estate company was not notified that immediate building was intended, it might be held that it was not chargeable with foresight that its delay in making the promised survey would result in H going ahead with a building without first having the lot lines defined. And, if the cost of moving the cottage will be comparatively small, I would be inclined to advise H bearing it rather than plunge into litigation which might prove to be expensive in the long run.

However, as a matter of equity the company should bear the expense, and it is quite possible that H could succeed in his suit on the theory first stated—that he had a right to assume that there was no substantial variance between the true lot corners and those pointed out to him. Furthermore, he has the advantage of being in possession of the land occupied by the cottage—parts of two lots—and should he choose to sit back and rely on his possession, I am inclined to believe that he could not be dispossessed by suit until and unless the company first pays him the cost of moving the building.

ALL readers are invited to ask any questions that will help them solve any legal difficulty that they may be in. Our legal adviser will answer direct by mail and give his opinion as to the correct procedure. Questions and answers of general interest to the trade will be published in these columns. All inquiries must be accompanied by the name and address of the correspondent so that he may be answered direct or that he may be requested for further information if necessary to the intelligent answering of his question. No names will be published, only initials or a nome de plume. Remember that this service is free to subscribers. Address Legal Department, Building Age and The Builders' Journal, 920 Broadway, New York City.

Carpenter's Duty to Conceal Plumber's Defective Work

PLEASE answer a question which has come up in a more or less friendly way between a master plumber and me," writes a subscriber. "He claims that if he furnishes twisted or misshapen trays or sinks it is the carpenter's place to make his work conform to the defective material, so that no extra expense will fall on the plumber in consequence of such defective material. The plumber asserts that he should not be expected to go to the expense of returning the defective pieces and getting perfect ones. I claim that if the carpenter makes the changes necessary to conceal the defect, it is a matter of good nature and not of compulsion; separate contracts having been made with owner.

So far as the plumber is concerned, he has no right to have the defects of his work concealed in this manner, and it may not be done without the owner's consent. And, in our judgment, the carpenter should not make his work conform to such defects without first securing the owner's approval. Otherwise, the carpenter may be held.

The plumber cannot excuse installation of defective work on the ground asserted by him. Nothing can excuse that save the owner's assent. If a plumbing supply concern has sent defective material to the plumber, his redress is against the concern. The owner is entitled to what he has bargained for, regardless of the expense that may be entailed against the plumber. And whether the owner will require new installation to conform to the contract, or insist on an allowance of damages, or waive the defect is up to him.

In such a case, the carpenter is under no obligation to the plumber. His obligations are to the owner, and he cannot safely change his work to conform to defects created by a co-contractor, the plumber. A contracting carpenter can excuse departures from his contract only through the assent of the owner, and, in our opinion, is running a risk in concealing defects of other contractors. His good nature toward the plumber should go no further than to give fair warning to the latter that unless the plumbing defects be so far corrected as to permit the carpentry work to be done according to contract, the owner's attention will be drawn to the defects and instructions asked as to whether it is desired that the carpentry be performed to conform to the contract or to the plumbing. It is only in this way that the carpenter can keep "in the clear" with owner.

In cases where the plumber is the carpenter's sub-contractor, it is, of course, strictly up to the carpenter to see that the plumber does his work in a proper manner.

USEFUL CATALOGS



ON this page we give short descriptions of some very interesting catalogs, etc., that have just been issued by different manufacturers.

They will be sent free on application to any of our readers who are interested, but should you prefer to write us, give the date of this issue and title of the catalog desired, and we will have them sent to you.

Zinc for Roofs

EUROPE has been using zinc for roofs for more than one-hundred years. How it is used in this country is interestingly described in a booklet entitled "The Roof That is Always New." which is published by the Illinois Zinc Company of 280 Broadway, New York, and a copy will be sent to any interested reader.

Chains for Buildings

THEY are used for many purposes in different parts of a building. For horizontal hung doors on cupboards there is a special use for them. An interesting catalog showing different makes of chains for building purposes is issued by the Bridgeport Chain Company of Bridgeport, Conn., and will be sent to any of our readers who is interested.

Kitchen Improvements

THE modern tendency is to have smaller rooms combined with the maximum amount of comfort. This is especially true of kitchen equipment in small apartments and houses. Builders doing this class of work will be interested in receiving a copy of the catalog of Wasmuth-Endicott Company, Andrews, Ind., describing their standardized "kitchen-maid" unit system of equipment. Many floor plans of kitchen layouts are given together with illustrations and descriptions of various sorts of kitchen equipment.

Washing Machines

BUILDERS are often called upon to furnish some sort of washing machine for the laundry equipment and the speculative builder finds that a house sells more readily if such an equipment is included with the building. A rather interesting folder describing the Laun-Dry-Ette is issued by the Laun-Dry-Ette Manufacturing Company, New York. This machine possesses some advantages that make it much preferred by many housekeepers and as it is the business of the builder to please, it is well if he kept posted on this subject. The folder will be sent to anyone interested.

Artistic Slate Roofs

THE old English method of slate roofing breaks up the checker board effect that is common in ordinary slate roofs. An interesting circular describing how this is accomplished has just been issued by the S. C. Sheldon Slate Company of Granville, N. Y., and a copy will be sent to any builder on request.

Circular Saws

EVERY builder operating a shop or having a portable power saw on the job will be interested in the new catalog No. 38 issued by Huther Bros. Saw Mfg. Co., Rochester, N. Y. It consists of ninety-four pages and contains a good deal of useful information about the selection of the proper saw for each particular type of work.

Vacuum Cleaner

THE desirability of a cleaning method that is permanently installed in a building is attractively set forth in a catalog issued by the Spencer Turbine Company of Hartford, Conn. A copy of this will be sent to any reader interested.

Casement Windows

CHARMING effects are possible by having the right sort of a casement window. An attractive little catalog describing metal casement sash and frames has been issued by Henry Hope & Sons of 103 Park Avenue, New York.

Door Checks

THE booklet describing the Worcester Blount Door Checks has just been issued by the Park Mfg. Company, 48 Lagrange, St., Worcester, Mass. This contains much useful information about installing and setting door checks and will be sent to any reader interested.

Shingle Nails

A RATHER interesting folder comes from the W. H. Maze Company, Peru, Ill., describing zinc coated nails; they make a special zinc shingle nail and the folder contains some good points regarding shingling that will pay any builder to be familiar with. A copy will be sent to any of our readers.

Magnesite Stucco

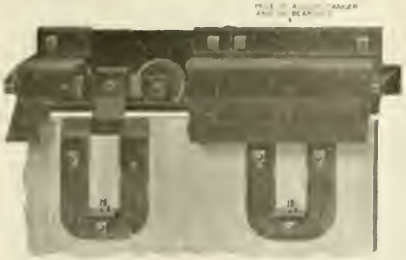
INTERESTING indeed is the illustrated folder on Flint-Rock Stucco just issued by Flint-Rock Corporation, Ingomar, Ohio. It describes the discovery of magnesite cement by Sorel in 1867 and its later day applications to stucco work. One great advantage of magnesite stucco is that it can be applied in cold weather. A copy of this interesting folder will be sent to any of our readers on request.

Improved Shower Bath

AN improved shower bath that can be easily attached to the bathtub faucet is made by the Kenney-Cutting Products Co., 507 Fifth Avenue, New York. This fixture allows use of the shower or tub by simply turning a valve which directs the flow of water. Four shower heads instead of one direct the needle streams against the body. These shower heads are adjustable to height and to install it no changes or alterations in plumbing are required.

By the use of this attachment, a shower can be used in an ordinary bath tub without splashing and the use of a curtain. It is a handy contrivance for any bathroom which does not have the luxury of a built-in shower and needle bath compartment.

Heavy Doors Made Light



Note how National No. 88 carries the door closer to the rail than any other type hanger.

This feature of carrying the door closer to the rail, and the feature of vertical-and-lateral adjustment indicate our ground for saying that *you* need not put any study into the purchase of hangers and rails—because National has put an exhaustive amount of study into the subject. *Just order Nationals.*

For instance, you want
Simplicity
Generous Capacity
Storm Protection
Right Roller Bearings for
Distribution of Load
Rigidity and Adjustability

No. 88 National has all these factors; its special adjustment construction is also extremely simple and easily operated.

With National No. 88 Door Hanger is used the Storm-Proof Rail with Protective Cover shown in the right hand illustration. This Rail is bird-proof and storm-proof; it requires no brackets or splice covers.

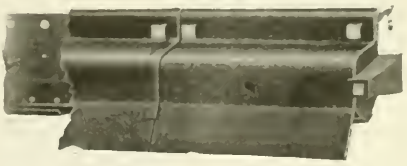
Translating hundred-weights into pound-weights is one of the missions of National No. 88 Door Hanger. Another is adding its quota to the reputation of the Builder who hung the doors.

Every time the owner slides open this easy-gliding door—especially if he has had experience with the sticking, unwieldy type of big door, that has to be tugged or shoved by main strength—he experiences a warm glow of satisfaction that his Builder had the foresight and wisdom to choose

NATIONAL

No. 88 Adjustable Storm-Proof Door Hangers and Rail

for every large or heavy door, in city or country



Note how this Rail protects the top of door

National No. 88 Adjustable Storm-Proof Door Hangers are furnished by dealers, packed 1 pair in a box with bolts for attaching, also lag screws and end-caps for the rail, complete with illustrated instructions for attaching the Hanger and Rail.

Send for valuable catalog, "Builder's Hardware"; it is instructive

NATIONAL MANUFACTURING COMPANY

STERLING ILLINOIS

National

Review of the Building Situation

BUILDING statistics for October just published by F. W. Dodge Company show that the volume of contracts awarded during October in the twenty-seven Northeastern states were 14% ahead of those reported for October of last year. At this period of the year, a regular seasonal decline is to be expected and this is shown in the drop of 7% from that of the September figures. We, however, have to consider that owing to the fuel and car shortage, construction activity was hindered to a certain degree. Were it not for this, the possibility is that the decline would be very much less. Under the circumstances, however, the showing for October is quite remarkable and shows a continued and healthy activity in the different branches of the building industry.

Residential construction continues in the lead, the October contracts for this class of construction amounting to $110,776,200 or 40% of the month's entire total. This figure is an increase over the amount of contracts in September. The revival of residential construction this year has overshadowed everything else in the building field—has broken all records.

One of the best signs, however, for the prosperity of our country, besides residential construction is the fact that industrial construction has averaged about $27,000,000 per month compared with $14,000,000 per month in 1921. This is an increase of nearly 100% and is indicative of continued prosperity for our country.

In New England the contracts awarded for residential construction for October exceed that spent in September by $2,000,000. In New York the figure has slightly fallen off from that of September, but still amounts to $33,000,000.

According to the reports the amount of new construction for which contracts were awarded from January 1st, 1921 to January 1st, 1922, amounted to the immense sum of $2,887,446,300! 1920 was the next highest year and during a like period the amount of contracts awarded amounted to $2,331,411,000.

In the Mid-Atlantic District there was a decline from the September total and also about 6% from that of October, 1921. Curiously enough, the contemplated new work reported for the same territory amounted to $52,723,000, being an increase of 38% over the amount contemplated as reported in September.

The coal strike in this section was responsible for this condition and now that it is settled it is reflected in the demand for additional building as shown by these figures.

Record of October, 1922, Building Contracts Awarded

Classifications of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$3,473,500	$8,364,000	$5,480,100	$7,357,700	$6,965,900	$395,400	$32,036,600
Educational	1,965,900	4,224,200	2,826,200	3,294,000	4,623,100	504,000	17,437,400
Hospitals and Institutions	2,046,200	3,761,700	413,100	200,000	2,120,000	.....	8,541,000
Industrial	2,390,000	6,098,500	2,838,700	7,358,000	8,838,500	116,000	27,639,700
Military and Naval	10,000	3,600	150,100	.....	282,000	.....	295,600
Public Buildings	101,500	514,200	150,000	127,000	251,600	.....	1,144,400
Public Works and Utilities	1,263,400	5,903,400	5,571,300	10,129,300	18,564,800	45,000	41,477,200
Religious and Memorial	536,100	1,385,300	1,506,200	1,157,000	2,588,500	50,500	7,223,600
Residential	14,165,700	33,024,200	11,500,300	22,912,000	27,390,300	1,783,700	110,776,200
Social and Recreational	409,500	1,695,000	1,145,400	2,263,000	1,052,100	.....	6,565,000
Total	$26,361,800	$64,974,100	$31,431,400	$54,798,000	$72,676,800	$2,894,600	$253,136,700

Building Projects Contemplated, October, 1922

Classifications of Buildings	SECTION OF COUNTRY New England District	New York District	Mid Atlantic District	Pittsburgh District	Middle West District	North West District	Totals
Business	$7,614,500	$12,805,500	$8,386,100	$4,694,100	$17,931,900	$944,400	$52,376,500
Educational	2,010,000	4,763,500	7,409,000	4,688,500	11,638,100	1,271,000	31,780,100
Hospitals and Institutions	1,680,500	791,000	503,000	589,000	3,405,000	50,000	7,018,500
Industrial	7,796,900	3,359,500	2,088,100	8,044,000	15,167,500	919,500	37,375,500
Military and Naval	.....	18,000	.....	30,000	277,000	.....	325,000
Public Buildings	328,800	727,000	57,000	370,000	3,648,000	120,000	5,250,800
Public Works and Utilities	9,797,300	4,456,000	6,906,800	10,989,400	25,085,400	2,277,700	59,512,600
Religious and Memorial	1,379,100	1,577,800	2,623,000	2,288,000	3,410,500	228,500	11,506,900
Residential	20,548,400	65,644,700	23,923,400	32,363,200	51,376,800	3,888,300	197,744,800
Social and Recreational	2,061,000	2,819,800	826,500	1,474,500	5,023,700	1,068,200	13,273,700
Total	$53,216,500	$96,962,800	$52,722,900	$65,530,700	$136,963,900	$10,767,600	$416,164,400



Residence — Highland Park, Illinois. Robert Seyfarth, Architect, Chicago. "Exterior of Redwood Sawn Shingles."

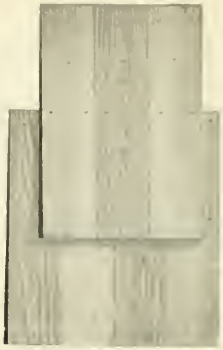
Redwood Special Sawn Shingles

IN residence construction these new style sawn shingles give an appearance of wide clapboards—a style which is fast becoming a distinctive feature of the better class of new residences in the Middle West and the East.

Side walls of Redwood sawn shingles suggest careful specification of the highest grade materials—give an air of distinction to a house which makes it easier to sell.

Redwood Special Sawn Shingles are either 24 inches or 26 inches long, as desired. Both sizes are 5½ inches wide and ¾ inch thick at the butt. Laid 13 inches to the weather, they give the pleasing appearance shown in the illustration.

Made from clear, properly seasoned Redwood, these shingles do not warp. They take paint well and hold it indefinitely. Permeated with a *natural*, odorless preservative during the growth of the tree, Redwood lumber, shingles and millwork are protected against all forms of rot and decay. Their use for exterior construction gives greater permanence and value to any frame building.



Redwood Special Sawn Shingles

For the convenience of builders and architects, we have recently issued our "Construction Digest" and our "Engineering Digest" which either our New York or Chicago office will gladly forward, together with such other information on Redwood as you may request. Write for them.

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Interior Finish
Natural, stained or painted Wood Block Floors.

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Tanks and vats for water, chemicals and oil, factory roofs and gutters, wood block flooring.

Wood Specialties
Such as Caskets and burial boxes, incubators and ice cream cabinets, cigar and candy boxes, etc.

Railroad Uses
Such as Railroad ties and tunnel timbers, signal wire [illegible] and water tanks, creosoting and roofing.

Farm and Dairy Uses
Such as Silos, tanks and troughs, hog feeders and implement sheds, wood block floors, etc.

"The Western wood for Eastern homes"



PAINTING

Practical Points of Interest to the Builder

Painting *and* Bronzing Radiators

By A. ASHMUN KELLY

OLD radiators should be made clean before giving them a coat of paint or bronze liquid, washing off grease with benzine. After cleaning and dusting off apply any desired coating, even white. Aluminum bronze stirred into a good bronzing liquid until of the consistency of thin paint, may be easily applied with a soft hair brush. One or two coats, as required.

You can make a very good bronzing liquid by taking equal parts of gold size japan and light colored baking varnish and mixing together. To each ounce of this liquid add three ounces of turpentine. Shake in a bottle for use. Bronze powder gives a higher luster by being sifted on a tacky varnish surface.

Apply a coat of baking varnish to the radiator and when it has dried to a "tack," or to that condition that when a finger is touched against it there is a feeling of slight adhesiveness.

Apply the dry bronze powder or aluminum with a dry camel hair brush or a bunch of raw cotton. The brush is best, because it enables you to get easily into small recesses, etc. Place a paper under the radiator to catch the bronze powder as it falls.

For ordinary radiator work a liquid made from good copal varnish thinned down with turpentine, will be found satisfactory; let it dry to a tack, then dust on the bronze. Or if you choose to mix bronze and liquid together, let it be in the proportion of equal parts.

To bronze steam pipes and radiators, using dry gold bronze, paint the pipes and radiators with medium chrome yellow, in oil, thinned with a little turpentine and varnish, and when dry enough rub on the powder. When it is hard-dry apply a coat of thinned copal varnish.

RADIATORS are sometimes painted white, a rather difficult color, one may say. The heat yellows ordinary white paint, so that a special paint must be used. The first coats are made with zinc white, thinning with turpentine. The coats are to be made smooth with sandpaper. Or at least as smooth as possible. On this foundation place two coats of the lightest gum copal varnish. Lithopone is said does well as the base.

Here is a factory formula, which gives a radiator paint that dries without luster and is discolored very little by the heat. White zinc oxide, barytes and powdered soapstone are ground together in japan gold size, turpentine and carbon tetrachloride, in equal parts. Or it can be ground in a celluloid liquid, and there will be no discoloration at all. But the better way is to find a dealer who sells radiator white.

Oil paints will not do, as the oil is more than likely to blister, while the color will turn brown and peel off. The best we can do with oil paint is to use zinc white thinned with turpentine to make it dry dead. On top of this the varnish may be applied. But the varnish may soften under the heat, especially the low grade varnishes, which contain rosin. If a baking varnish is used, the purpose being to place the work in an oven, then the varnish coating may be applied much heavier than otherwise it should.

A black radiator varnish is made from the best Syrian asphaltum, or Gilsonite will do as well, heating ten parts over the fire, with two parts of raw linseed oil, until sufficiently fluid. When it is cool thin it down to the consistency of varnish with turpentine.

TO do the logs of gas radiators in imitation of wood, they are usually coated with copper bronze or green bronze, and then blended in with colors that will simulate the natural colors of the barks of certain trees. To make the log look like birch or maple, for instance, or as those barks sometimes appear, asbestos fiber is attached in various parts of the logs.

The pigments used for this work have to be fire-resistant; these are raw and burnt umber, Indian red, mineral brown, oxide of chromium green, or copper green. The medium used in mixing the paint is silicate of soda, for there is neither oil nor gum that will stand the degrees of heat generated by these gas-lit metal logs.



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Johnson's Floor Varnish dries dust-free in two hours and hard over night. It imparts a beautiful, high lustre—has good body—will give long wear—is absolutely water-proof—and will stand all reasonable tests.

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Johnson's Floor Varnish is tough, elastic and durable. It gives a beautiful, high gloss which will not chip, check, mar, blister or scratch white. Is very pale in color so can be used on the lightest floors and linoleum. Splendid for furniture, woodwork and trim of all kinds. May be rubbed if desired.

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Things the other man has found out that save money



How Quantity Surveys Cut the Cost of Preparing Estimates

Prepared by the Committee of Quantity Survey
Society Construction of Federal Buildings

J. W. GINDER, Chairman

THAT the quantity survey, as a system, has great merit is conceded by all interested in the building industry, but its general adoption in this country has been delayed by several causes, one of which, the World War, resulted in a necessary suspension of all building activities. Of other reasons assigned for the delay in its adoption may be mentioned the dubious attitude of some who imagine that a new, and, as they say, non-producing factor is to be added to the industry: the query, "Who will assume the burden of cost?" is propounded.

The apparent reluctance to abandon old methods, admitted to be faulty, is being dispelled, however, as knowledge of the quantity survey becomes assimilated.

A quantity survey has been defined as a comprehensive and systematically prepared schedule of all the materials to be incorporated in a structure—the result of a thorough survey and check of the required drawings and specifications by highly-trained technical men.

The most important purpose of a quantity survey is that of rendering on the same basis as to quantities all bids of the competitors for the work. Thus, in formulating his bid, the competitor has only to append to the material costs his labor costs, "overhead," profits, etc., which may be applied by the unit system or otherwise.

These schedules are so prepared that contractors or others interested may readily determine the character and value of any article indicated. Such indications are graphic descriptions, supplemented by measurements and diagrams if necessary, but in no case are they to be used in lieu of the drawing and full size details from which to execute the work.

Error Reduced to a Minimum

Some opponents have thoughtlessly condemned the system on the ground that inaccuracies may occur. An indemnifying bond as a guarantee of accuracy has been suggested.

The functional interdependence of a careful survey of quantities and a thorough check of the survey is a feature of the proposed system. The possibility of error is reduced to the minimum. What of the probability of error under the present system? How often is the success of a competitor attributable solely to error in taking off quantities? It may be said that absolute perfection will not be attained, but it is reasonable to assume that the element of error will be no greater than that of any survey made in the office of the contractor under the usual unfavorable conditions under which most estimates are made.

For obvious reasons, adjustments before the award of contract are not generally advocated, but any antagonism due to this fact can readily be dispelled. These adjustments can certainly be made after the award of contract.

In some instances purchases of the materials are made and bids for labor only are required. If after the surveyor's check inaccuracies still remain, and it is discovered during construction or after completion that the scheduled quantities upon which the labor bids were based were either inadequate

The Owner Pays

PROBABLY the chief difficulty in securing the adoption of this Quantity Survey System is that of convincing the owner that the added fee for the quantity surveyor, which may be paid either directly or through the architect, is in reality a saving.

Under the quantity survey system he is paying for this service only once, while under the present practice (though it may not be apparent to him) it is paid proportionately to the number of bids.

The Testimony of a Decade



Time will tell—*it has told!* Ten years have now elapsed since Keystone Copper Steel was first offered to the trades as possessing greatest *rust-resistance.* Our original claims for this copper steel alloy have been fully substantiated—and the years continue to add to the weight of evidence, and to further prove its superiority for

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We have assembled in a brief booklet a few of the outstanding facts showing the excellence of Copper Steel, together with opinions of eminent authorities, official photograph of weather tests and graphic chart showing corrosion losses of steel and iron sheets. This booklet is of particular interest to builders and users of sheet metal—and will be sent upon request.



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For building construction—roofing, siding, gutters, spouting, eaves trough, sheet metal and tin work—use Keystone Copper Steel Galvanized Sheets and Roofing Tin Plates—the highest quality obtainable. Sold by leading metal merchants.

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or in excess of the requirements, then the adjustments for labor can be made.

These applications of the system are cited to show that no interests can be jeopardized by the fact that a quantity survey may lack perfection.

Accuracy Guarantee

IT is now possible to obtain, with a quantity survey, a guarantee of the accuracy of same to within a small percentage of the total sum involved. The contractor may assume this differential by omitting it and the cost of the indemnity as components of his bid, or he may transmit them to the owner. With the view of maintaining at the minimum the cost of the quantity survey, some advocates assert that a guarantee of accuracy necessarily involves an additional cost and an element of chance for which some interest must pay, and furthermore, is superfluous if the system is properly applied.

Due to the diverse methods of estimating employed, there really exists in connection with the present system of contract awards a competition in the quantities of materials involved by construction work. To eliminate this quantity competition is a function of the quantity survey, and thus is simplified the whole matter of competition.

The intent of the drawings and specifications may be in some respects quite vague and ambiguities may exist, but to this can be attributed only a very small percentage of the wide varieties of the material bills as ascertained by different estimators. The quantity survey clarifies, and every bidder commences work on his proposal with the satisfying knowledge that the entire job has been carefully examined.

Cutting Out the Gamble

The necessity for improvement of methods has long been felt, and such need is emphasized by the contractor's wail that instead of engaging in a business he is playing a most hazardous game. In any discussion of a contractor's business you will hear the assertion that the business is a gamble, that profits cannot be assured, and that a contractor's hope of salvation is that from some future work an abnormal profit can be derived which will compensate or overbalance the losses sustained on work which has been performed. This is a frank admission and is indicative of an unhealthy condition which certainly calls for the administration of some treatment. Primarily, competition will not permit a realization of the hope for large profits. The uncertainty of chance must be eliminated, or at least reduced to a minimum not in excess of that of any other business.

IN order to procure the necessary volume of work, it must all be on a close margin; and it is seldom, if ever, that a contractor can withstand a loss.

As diagnosed by most authorities, the fault is with the contractor himself, and consists of blindly following precedent, employing methods some of which are now obsolete and others which never had any valid reason for existence; in numbers of cases there is an absolute failure to acquire the requisite knowledge of the materials to be furnished and the work to be performed.

A contractor sustaining losses is prone to communicate them to others with whom he is in contact, and it is thus that the whole industry is rendered ill and in need of a remedy.

Provide for Overhead

In addition to a profit on his material and labor costs, a contractor is entitled to a reasonable margin on his operating costs, inclusive of his own salary and the costs of estimating with other office expenses. In every proposal should also be given due consideration to depreciation on plant and equipment, interest on borrowed capital, taxes, and losses through bad accounts. If the business is to endure, such business principles cannot be ignored or laid aside for the gambling methods, and the contractor who is habitually remiss in making up his bid and who applies his prices and profits by the rule of guess cannot find salvation in the quantity survey system, as through force of habit, he will continue his rule of guess practices and eventually be self-effaced. The contractor who excels in management is an advocate of the quantity survey system.

It has been said that the surveys could not be satisfactory, as no two estimators employ the same methods, and that the contractor, whose business it has always been, is as capable of preparing a survey as any other person. Granting the truth of these statements, the fact remains that the one official survey, prepared by one or more surveyors, would govern any competition. There can be but one survey of any protect. If it were otherwise, it is apparent that the present chaotic conditions would be but little improved.

Must Be Official

The profession of quantity surveyor and the surveys must be inseparably linked with the word "official" by virtue of license by the owner or architect. The institution of the system and its operation does not, as some suppose, provide a wide field of operation for competing surveyors, who will sell their products to the contractors.

IN some instances, contractors' associations have established survey bureaus from which could be procured uniform surveys of any desired project, but it is to be noted that even in this connection uniformity is the very essence of the matter.

The survey, in conjunction with the unit rates of the proposal, has a value which will be appreciated by the owner and architect.

The uncertainty of chance being eliminated from the business of the contractor, the owner need no longer fear the possibility of being compelled to assume this chance in some degree unknown.

As in any sound business arrangement, the owner, who corresponds to the consumer, must assume the costs of estimating or overhead of the vendor, the contractor.

Eliminate the Waste

Confronted as we are at the present time by the greatly increased costs of all commodities, which may or may not have reached the peak of their ascen-


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sion, it has obviously become necessary to eliminate from all transactions every source of waste.

Of the various industries none has been more severely affected or feels more acutely the necessity for some relief than building.

With the exorbitant costs of raw materials on the one hand and of labor, skilled or otherwise, necessary to shape them into finished structures on the other, together in many instances with excessive profits or commissions being exacted by distributors and contractors, the tentative builder of limited resources, who may not hope to protect his investment by correspondingly increased rentals, is driven entirely out of the market and the field is largely restricted to investors of unlimited means.

The System in Vogue

For relief, as concerns material and labor costs, we must apparently wait until the law of supply and demand shall ultimately lower or stabilize these, but, in the meantime, it is certain that an appreciable effect may be realized through the adoption of other more efficient business methods and procedure than now obtain, by which the added or "overhead" expenses of operation and administration would be in a measure curtailed.

For instance, by the system generally in vogue at the present time, the drawings and specifications for a proposed building project go into the offices of the various contractors from whom competitive bids are being solicited, in each of which separate estimates may be prepared in more or less detail and with varying degrees of accuracy, according as errors occur in "taking off," etc.

The above, of course, takes no account of that class of contractors referred to above whose estimates, being the result of a general scanning of the work contemplated and a comparison with a similar structure previously built, are only too often disastrous both to themselves and their patrons, which practice will inevitably eliminate them in time from the field.

Experience has shown that an estimate prepared with any degree of accuracy will generally range in cost between one-half of 1 per cent. to 1½ per cent. of the actual cost of the finished work.

Assuming that in the manner prescribed above estimates have been prepared by six competitors, the process has been duplicated six times, which, taking the lower of the above limits, brings the total expenditure for estimating the job in question up to 3 per cent. of its cost, and, under certain conditions, may reach 9 or 10 per cent., as the bidders increase.

It will, therefore, be seen that elimination of this duplication in the taking off or surveying of projects must of necessity produce an appreciable saving in incidental expense. This elimination of duplication is one of the advantages to be realized from a general adoption by the building world of the quantity survey system.

Contractor's Equipment

By I. P. HICKS

IT is quite natural for one to think that the contractor doing a general contracting business should at least be equipped with some of the essential and necessary tools to work with, so that he may be able to do the various jobs that he is called upon to do without being handicapped by lack of the proper equipment to work with.

Just how much and just what the equipment should be depends very much upon how big a business the contractor can reasonably expect to enter into. The bigger the business the more there will be needed and some things are needed even to the small contractor. As a rule, it is the general contracting carpenter who heads the list in the building field and he is the one to whom all others look for guidance on nearly all the work done on or about the building.

The contracting carpenter should have a shop say, 20 x 30 feet or 24 x 30, something like this at least. A place to do shop work on the odd jobs that come along is necessary for there must be a place to work and the place must be handy and convenient to make it pay financially and this it will do if it is properly looked after. It should at least be equipped with a power rip saw, a mortising and tennoning machine and a surfacing machine or planer. If not all installed at once take them in the order as noted above, then you will get what is most needed first and you can add the other as you can.

Make good work benches for it is very hard to work on hollow back and shaky benches. Don't stop with the idea that any old thing is good enough to work on, for it is a mistaken idea. Also make a good light movable bench to take out on jobs when necessary. This is quite essential, for it facilitates work very much to have a good bench on the job. Also have plenty of good saw horses not heavy and clumsy, but light and strong. They should be strong enough for general use.

As the contractor usually has more or less running about to do looking after material and always some material and supplies to take to and from the jobs a light auto truck is a very desirable thing to have.

There are many times in the building business when jack screws are needed and it is well to have from two to six of these on hand.

The contractor should have a floor scraping machine or an electric sander. If you have electricity, use the sander, if not, use the floor scraper, either will save a lot of hard and tiresame hand work.

If the contractor contracts for brick work and cement work on big buildings it will be necessary to have equipment to handle this kind of construction. In this case a good machine concrete mixer is necessary, together with wheel barrows, shovels, hoes, hose, etc.

For tall buildings, a power hoist is necessary to carry on the work in a speedy and satisfactory manner. Man power is too slow and costly for any large job. It is always more profitable to use a power lift on large jobs, but on small jobs it will not pay to put in the power equipment. These are things that the contractor has to size up for himself and use his own judgment on.



Conservation can be practised by following the wise plan of giving necessary things, therefore, let your slogan be—

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Trend of Material Prices

THE following are wholesale prices of basic building materials in the three markets which set prices for the rest of the country.

These prices are presented to show the trend of the wholesale market, which forecasts prices in the retail market. They are not prices which the average contractor can buy at, but are quoted to show him the movement of materials so that he can buy to better advantage.

Followed in conjunction with the Review of Building Conditions, these prices will prove invaluable.

All prices are for carload lots, F. O. B. market quoted, unless otherwise noted.

NEW YORK PRICES

	Oct. 28	Nov. 25
LONG LEAF YELLOW PINE—		
B. and Better Edge Grain Flooring, 13/16x2¼" Face...	$91.00	$91.00
Dimensions, S1S1E, No. 1 Common, 2x4", 10'.....	44.00	44.00
Timbers, Merchantable, '05, 12x12", 10 to 20'.....	58.50	58.50
B. and Better Ceiling, ½x3¼.....	47.00	47.00
B. and Better Partition, ¾"x3¼".....	65.00	65.00
B. and Better Finish, 1x4".....	67.00	67.00
No. 1 Common Boards, 1x8".....	49.25	49.25
NORTH CAROLINA PINE—		
No. 2 and Better Flooring, 13/16x2½".....	$66.00	$66.00
Roofers, 13/16x5½"	35.50	35.50
DOUGLAS FIR—		
No. 2 Clear and Better V. G. Flooring, 1x3".....	$75.00	$75.00
No. 1 Clear V. G. Flooring, 1x4".....	75.00	75.00
No. 2 Clear and Better Ceiling, ¾x4".....	50.50	50.50
No. 2 Clear and Better Novelty Siding, 1x6".....	54.00	53.50
No. 2 Clear and Better V. G. Stepping.....	91.00	91.00
WESTERN RED CEDAR—		
B. C. Perfection Shingles, per M.....	$7.68	$7.78
Washington Perfection Shingles, per M.....	7.42	7.55
Clear Bevel Siding, ½x6".....	52.50	52.50
CANADIAN SPRUCE—		
No. 1 Lath, 1½".....	$9.25	$9.68
Dimension, 2x4", 10 to 16'.....	34.00	33.00
HARDWOOD FLOORING—		
Clear Quartered White Oak, 13/16x2x2¼".....	$158.50	$158.50
Clear Plain White Oak, 13/16x2¼".....	113.50	113.50
Clear Plain Red Oak, 13/16x2¼".....	113.50	113.50
Clear Maple, 13/16x2¼".....	103.00	104.00
(All lumber prices furnished by Lumber)		
COMMON BRICK—		
Per M. f. o. b. job.....	$20.00	$18.40
PORTLAND CEMENT—		
Bbls. in car lots to contractors, delivered.....	$2.90	$2.80
STRUCTURAL STEEL—		
Per 100 lb. at warehouse.....	$3.14	$3.14
CRUSHED STONE (cu. yd.)—		
¾ in.	$2.90	$2.90
1½ in.	2.75	2.75
WALL BOARD—		
Per 1,000 sq. ft. in lots under 1,000 sq. ft.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1,000 to 2,500 sq. ft.....	45.00	45.00
METAL LATH—		
2.3 lb.—26 gauge price per 100 sq. yd. delivered.....	$21.00	$24.00
2.8 lb.—24 gauge light price per 100 sq. yd. delivered.	23.00	26.00
3.4 lb.—24 gauge heavy price per 100 sq. yd. delivered	23.00	28.00
Add 5 cents per sq. yd. for galvanized.		
LIME (Hydrate)—		
Finishing, per 50 lb. bag.....	$0.60	$0.60
Masons, per 50 lb. bag.....	.49	.49
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.55	$1.55
¾ in. Gravel (per cubic yard).....	2.90	2.90
1½ in. Gravel (per cubic yard).....	2.90	2.90
FACE BRICK—		
Tapeatry (delivered)	$46.00	$46.00
Caledonian (delivered)	43.00	43.00
Smooth Grey (delivered).....	47.00	47.00
Fisk Lock f. o. b. factory.....	36.00	36.00
SHINGLES—		
Asphalt, Single (per square).....	$8.25	$8.50
Asphalt, Strip (per square).....	6.50	7.00
STAINED WOOD SHINGLES—		
16 in. Extra Clear (per square, delivered).....	$11.00	$11.00
18 in. Eureka (per square, delivered).....	11.00	12.00
18 in. Perfection (per square, delivered).....	12.00	12.00
24 in. Royal (per square, delivered).....	12.25	12.25
24 in. Imperial (per square, delivered).....	12.50	12.50
VITRIFIED SEWER PIPE—		
4 in. (cents per foot).....	$0.12	$0.12
6 in (cents per foot).....	.18	.18
SLATE ROOFING—		
Bangor or Slatington, 8x16 in. (per sq. at quarry)...	$8.40	$8.40
CORNER BEADS (Galvanized)—		
Per Foot	$0.05	$0.05
WALL TIES (Galvanized)—		
Per Thousand	$5.00	$5.00
FLUE LINING—		
8½ x 8½ in Per Foot.....	$0.33	$0.33
8½ x 13 in. Per Foot.....	.50	.50
HOLLOW TILE—		
8 x 12 x 12 in., heavy. Each, delivered.....	$0.22½	$0.22½
HAIR—		
Per Bushel	$0.60	$0.60
PLASTER BOARD—		
32 x 36 x ⅜ in., Each.....	$0.25	$0.22
MAGNESITE STUCCO—		
Per Ton	$65.00	$65.00
TILE—		
1 in. Square or Hexagon, White, per sq. ft.....	$0.25	$0.25
3 x 6 in. White Wall.....	.60	.60
8 x 8 in. Red Floor.....	.45	.45

CHICAGO PRICES

	Oct. 28	Nov. 25
YELLOW PINE—		
Boards, 1x8, No. 1 Com.....	$43.00	$43.00
Ceiling, ¾x4, B. and Btr.....	48.00	48.00
Dimension No. 1, 2x4, 12 to 14 ft.....	36.00	36.00
Drop Siding, 1x6, B. and Btr.....	55.00	55.00
Finish, 1x4, B. and Btr.....	62.00	65.00
Flooring, B. and Btr. E. G., 1x3.....	85.00	80.00
Lath, 4 ft., No. 1.....	8.00	8.30
Timbers, Long Leaf No. 1, 10-20 ft., S4S, 6x12 to 12x12	47.00	47.00
HARDWOODS—		
Maple Flooring, 13/16x2¼, clear.....	$99.75	$99.75
Oak Flooring, ¾x2, Cl. Pl., White.....	74.00	77.00
Oak Flooring, 13/16x2¼, Cl. Pl., White.....	108.50	108.50
REDWOOD—		
Bevel Siding, S1S1E, 10 ft., 20 ft., ½x4, clear.....	$44.25	$44.25
Finish, S2S or S4S, 1x6 to 8 in. clear.....	91.50	92.50
WESTERN RED CEDAR—		
Bevel Siding, ½x4 in., Clear.....	$53.00	$53.00
Shingles, Extra Clears, 16 in.....	5.16	5.16
COMMON BRICK—		
Per M. f. o. b. job.....	$12.00	$12.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.20	$2.20
STRUCTURAL STEEL—		
Per 100 lbs. at warehouse.....	$2.90	$2.90
CRUSHED STONE (cu. yd.)—		
¾ in.	$3.25	$3.37
1½ in.	3.25	3.37
WALL BOARD—		
Per 1,000 sq. ft. in lots under M.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	45.00	45.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$3.25	$3.37
¾ in. Gravel (per cubic yard).....	3.25	3.37
1½ in. Gravel (per cubic yard).....	3.25	3.37

ST. LOUIS PRICES

	Oct. 28	Nov. 25
YELLOW PINE—		
Boards, No. 1 Com., 1x4.....	$48.50	$39.00
Partition, ¾x3¼, B. and Btr.....	57.25	57.25
Dimension, No. 1, S1S1E, Short Leaf, 2x4 in., 12 & 14 ft.	37.00	37.00
Finish, S2S, B. and Btr., 1x4, 6 & 8 ft.....	62.50	63.50
Flooring, B. and Btr., E. G., 1x3.....	84.25	78.00
Flooring, B. and Btr., F. G,. 1x3.....	63.50	62.00
Lath, 4 ft., No. 1.....	6.75	7.85
Timbers, No. 1, rough, short leaf, 6x12 to 12x12 in. 10 to 20 ft.	39.50	39.50
CALIFORNIA REDWOOD—		
Finish, S2S, CL, 1x6 in.....	$91.50	$91.50
Siding, 4 in. Bevel, 10 to 20 ft.....	43.25	43.25
8 inch Colonial	69.25	69.25
8 inch Bungalow.....	69.25	69.25
HARDWOODS—		
Oak Flooring, ¾x1½ and 2 in., Clear Qtr. White.....	$106.50	$106.50
Maple Flooring, 13/16x2¼ in., Clear.....	91.25	100.50
RED CEDAR—		
Siding, ½x6, Clear	$48.00	$48.00
Shingles, Clears, Per M.....	5.25	5.41
COMMON BRICK—		
Per M., f. o. b. job.....	$18.00	$18.00
PORTLAND CEMENT—		
Bbls. in car lots to contractors, not including containers	$2.35	$2.35
STRUCTURAL STEEL—		
Per 100 lbs. at warehouse.....	$3.00	$3.00
CRUSHED STONE (cu. yd.)		
¾ in.	$2.20	$2.18
1½ in.	2.20	2.18
WALL BOARD—		
Per 1,000 sq. ft. in lots under M.....	$50.00	$50.00
Per 1,000 sq. ft. in lots 1 M to 2½ M.....	45.00	45.00
SAND AND GRAVEL—		
Sand (per cubic yard).....	$1.20	$1.25
¼ in. Gravel (per cubic yard).....	1.45	1.45
1½ in. Gravel (per cubic yard).....	1.40	1.40

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Contents by Chapters. Layout of Site Excavating, Sheet Piling and Pumping. Shoring and Underpinning. Stone Masonry. Water-proofing Foundation Walls. Concrete Construction and Forms for Concrete Footings and Foundation Walls. Brickwork. Hollow Tile, Construction and Costs. How to Do Stucco Work on Metal Lath, Brick and Wood Lath. How to Lay Out and Build Fireplaces. Chimney Design and Construction. House Framing. Roof Framing. Mitering Pinnecers, Mouldings, etc. Carpentry and Construction Kinks. Metal Ceilings and Walls. Estimating Quantities of Materials. Estimating Labor on Carpentry. Estimating Brickwork. Short Cuts in Estimating Forms, etc. Tables. 300 pages, 4½x7 inches, 300 figures. Flexible fabrikoid $3.00

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(See also Alphabetical Index, Page 112)

ARCHITECTS' SPECIFICATION HAND BOOK

Truscon Company, Detroit, Mich.

270. 52-page bound, loose-leaf specification book. 8½ x 11 in.

ASBESTONE PRODUCTS

Franklyn R. Muller & Co., 23 Madison St., Waukegan, Ill.

252. *Instructive Catalog* describing the product in full detail.

ASBESTOS PRODUCTS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

1. *Ambler Asbestos Shingles.* Catalog 5½ x 8½ in. 40 pp. Illustrated.
2. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog, 8½ x 11 in. 36 pp. Standard Purlin Spacing Tables.
3. *Ambler Asbestos Corrugated Roofing and Siding.* Catalog, 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
4. *Ambler Asbestos Building Lumber.* Catalog, 8½ x 11 in. 32 pp.
5. *Engineers' Data Sheets.* Catalog, 8½ x 11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.

ASBESTOS ROOFING—See also Roofing Materials

ASH HOISTS—See also Hoists

ASH RECEIVERS

Sharp Rotary Ash Receiver Corporation, 396 Bridge St., Springfield, Mass.

7. *Catalog E.* Booklet describing the Sharp Rotary Ash Receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6 x 9¼ in.
8. *Catalog F.* A book for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with tables of dimensions for installation. 8 pp. Illus.

BALANCES, SASH

Caldwell Mfg. Company, The, Rochester, N. Y.

9. *Suggestions for the Present-Day Architect.* Booklet, 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.

Pullman Mfg. Co., Rochester, N. Y.

10. *Catalog* describes new form of sash balance that can be removed and inserted without removing sash from window.

BAND SAWS

American Saw Mill Machinery Co., Hackettstown, N. J.

11. *Catalog No. 22* describing a general line of band saws of various sizes.
12. *Technical Data.* Four-page folder 8½ x 11 in. containing specifications, description, prices and approximate cost of installation. Everything the architect or contractor requires.

E. C. Atkins & Co., Inc., Indianapolis, Ind.

Crescent Machine Co., Leetonia, Ohio.

241. Descriptive 144-page Catalog.

BAR BENDERS AND CUTTERS

Koehring Company, Milwaukee, Wis.

13. *Four-page folder,* giving illustrations and sizes of Koehring Bar Benders and Cutters.

BATHROOM APPLIANCES—See also Plumbing Equipment

Hess Warming & Ventilating Co., 1201 Tacoma Bldg., Chicago, Ill.

Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.

401. *Send for illustrated Folder,* "A Bath a Day Keeps You Fit Every Way."

BEDS

Murphy Door Bed Company, Majestic Bldg., Chicago, Ill.

402. *Eight-page illustrated,* "How to Use the Murphy Bed."

BOILERS—See Heating Equipment

BOOKS

American Technical Society, 58th and Drexel Blvd., Chicago, Ill.

Architectural House Planning Service Co., 20 So. 18th Street, Philadelphia, Pa.

Arrow Book Company, 347 Fifth Avenue, New York City.

Building Age and The Builders' Journal, 920 Broadway, New York City.

"Beautiful Homes at Moderate Cost." $1.00.

Chicago Technical College, 1038 Chicago Tech. Bldg., Chicago, Ill

U. P. C. Book Co., 243 West 39th Street, New York City.

BLUE PRINTS

Peerless Blue Print Co., 347 Fifth Avenue, New York City.

403. *Splendid Drawing Board Outfits* are manufactured in conjunction with the making of blue prints.

BRICK

American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.

15. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Sent free.
16. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions are illustrated and described. Sizes 8½ x 11 in. 116 pp. Price $1.00.
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Common Brick Manufacturers' Association of America, 1309 Schofield Bldg., Cleveland, Ohio.

19. *Brick—How to Build and Estimate.* 3rd edition, 32nd thousand, a manual of solid brick and Ideal wall construction. Contains data on the strength of brickwork, on mortars, bonds and joints and equipment, and contains complete estimating tables for quantities of brick, mortar, material and approximate mechanics' time for various thicknesses and square foot areas of solid and Ideal wall. 8½ x 11 in. 72 pp. Price 25 cents.
20. *Brick for the Average Man's Home.* Book, 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price, $1.00.

Flake & Company, Boston, Mass.

145. *Tapestry brick, other grades of front brick.* Manufacturers "Fisklock" Brick.

BUILDING CONSTRUCTION—See also Garage Construction

National Manufacturing Co., Sterling, Ill.

404. *An 80-page catalog,* profusely illustrated with various kinds of Garage Hardware.

Truscon Steel Company, Youngstown, Ohio.

21. *Truscon Floortype Construction.* Form D352. Contains complete data and illustrations of Floortype installations. 16 pp. Ill. 8½ x 11 in.
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BUILDING HARDWARE—See Hardware

BUILDING STONE—See Stone, Building

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Knape & Vogt, Grand Rapids, Mich.

405. 16-*page booklet,* describing the "Garment Care System."

BUILT-IN KITCHENS

Bisk Corporation, Brockton, Mass.

406. 16-*page illustrated catalog,* giving the pictures and plans on the installation of the Built-In Kitchens. It describes in detail the various types and sizes.

BUNGALOW AND SMALL HOUSE PLANS

American Face Brick Association, 110 South Dearborn Street, Chicago, Ill.

25. *Four booklets* of small houses from 3 to 8 rooms, containing 98 reversible designs. (1) 3-4 rooms, (2) 5 rooms, (3) 6 rooms, (4) 7-8 rooms; size 8½ x 11 in. Each booklet 25 cents; set, $1.00.

Architectural House Planning Service Company, 20 South 18th Street, Philadelphia, Pa.

CANVAS—See Roofing Materials

CASEMENTS—See Doors and Windows

CAULKING AND GLAZING COMPOUND

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.

246. *Illustrated catalog* sent on request.

CEILINGS, METAL

The Edwards Manufacturing Company, Cincinnati, O.

33. *Pamphlet of 32 pages,* describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 in.

Keighley Mfg. Co., 124 Third Avenue, Pittsburgh, Pa.

407. *Catalog "M"* describes the Lock Joint Metal Ceiling.

CEMENT

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

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Portland Cement Assn., Washington Street, Chicago, Ill.

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Just 10c brings you this book—"Your Next Home"—an offer never equalled before. And specifications, working drawings and complete information for every one of these 60 homes are available at nominal price.

The Common Brick Industry *of* America
2133 CLEVELAND DISCOUNT BLDG.
Cleveland, Ohio

The Ideal Brick Hollow Wall is made of standard brick obtainable everywhere

Ideal Brick Hollow Wall

"Brick Homes at the Cost of Frame"

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 70*

CHAINS

Bridgeport Chain Co., Bridgeport, Conn.

29. *Catalog No. 14.* Contains 64 pp. Illustrated, of different chains that can be used in all parts of building construction.

CLAMPS

James L. Taylor Mfg. Co., Poughkeepsie, N. Y.

408. *Descriptive catalog* of the various Clamps.

COAL CHUTES

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

409. *An interesting folder*, describing the advantages of the Donley Coal Chute.

COLUMN BASIS

S. Cheney & Son, Manlius, New York.

250. *An Interesting Descriptive Booklet*, may be had on request.

COLUMN AND BEAM COVERING

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

39. *32-page booklet*, 8½ x 11. Pyrobar Tile.

COLUMNS

Hartmann-Sanders Co., Elston and Webster Avenues, Chicago, Ill.

233. *Catalog No. D-47.* 48 pages, illustrated. 7¼ x 10 in. Illustrating the Koll's Patent Lock-Joint Wood Columns.

CONCRETE APPLIANCES

Universal Cement Mould Co., No. Milwaukee, Wis.

41. *Illustrated Folder*, describing mold for building hollow concrete walls for homes, garages, barns, silos, etc.

Van Guilder Double Wall Co., 77 South Avenue, Rochester, N. Y.

42. *A Catalog* describing the Van Guilder system of portable forms for the building of hollow concrete walls on the thermos bottle idea for the erection of homes, ice houses, barns, silos, etc. Walls are dry, as there is continuous air space around entire building.

CONCRETE MACHINERY

The American Cement Machine Co., Inc., Keokuk, Iowa.

410. *An interesting 68-page illustrated catalog*, describing the "Boss" Labor Saving Construction Machinery.

Concrete Equipment Co., 535 Ottawa Street, Holland, Mich.

411. *Catalog No. 22* describes in detail the various products manufactured by this company.

Concrete Block Machine & Mold Co., 114 S. 2nd St., St. Louis, Mo.

253. *Catalogue No. 38.* Describes Building Block Machines. It is a 40-page book, 6 x 10 in.

Construction Machinery Co., 403 Vinton St., Waterloo, Iowa.

251. *Catalog M-33* describes the workings of the plant.

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.

412. *Bulletin No. 1* describes the Portable Saw Rigs.

413. *Bulletin No. 2* describes the Power Driven Pumps, Centrifugal, Pistons, Diaphragm, Triplex.

414. *Bulletin No. 3* describes the Hoists, Mortar Mixers, Material Elevators, Engines.

415. *Bulletin No. 4* describes the Tractor.

Ideal Concrete Machinery Co., 1334 Monmouth Street, Cincinnati, Ohio.

416. *A 100-page illustrated catalog*, describing the Ideal Machine and also data for manufacturing and curing Ideal Concrete Blocks.

417. *Catalog No. 37* describes the Ideal-Cincinnatus Batch-Mixers.

Jaeger Machine Co., 216 Dublin Avenue, Columbus, Ohio.

418. *A 40-page catalog*, well illustrated, describing the special features of a Jaeger Mixer.

419. *16-page folder*, illustrating a Jaeger for every mixer need.

Koehring Co., Milwaukee, Wis.

46. *Koehring Construction Mixers.* Booklet. 7¾ x 10½ in. Illustrated. 96 pp. Complete information on construction type concrete mixers.

47. *Koehring Dandie Mixer.* Booklet, 6 x 9 in. Illustrated. 24 pp. Illustrating and describing Koehring line of Dandie light mixers.

265. *"Built to Endure."* A beautifully bound booklet of 36 pages, 7½ x 10 in., describing Comparative Examples of Notable Ancient and Modern Construction Embodying the Element of Permanency.

38. *Concrete—Its Manufacture and Use.* Book, 4½ x 7 in. Illustrated. 207 pp. Comprehensive discussion from the practical standpoint of concrete.

Republic Iron Works, Box 602, Tecumseh, Mich.

421. *An eight-page illustrated pamphlet*, describing the Republic "Ten."

Standard Scale & Supply Co., 1631 Liberty Ave., Pittsburgh, Pa.

422. *28-page illustrated catalog*, describing quick, efficient and money-saving concrete mixing.

CONCRETE MARBLE

Art Stone Co., Waynesboro, Pa.

45. *Descriptive Circulars* with illustrations of different marbles in colors. Sent free to any interested party.

CONSTRUCTION, FIREPROOF

Central Steel Co., Massillon, Ohio.

423. *In the "National Steel Lumber" Handbook* is embodied complete information and authentic data pertaining to the use of Steel Lumber Sections and kindred materials.

424. *"National" Bulletin No. 19B* describes the National Shelby.

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.

226. *Standard Fire Proofing Bulletin 171.* 8½ x 11 in. 32 pp. Illustrated. A treatise on fireproof floor construction.

Truscon Co., Detroit, Mich.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

48. *Pyrobar Gypsum Tile.* Booklet, 8½ x 11 in. 32 pp. Illustrated. Detail and specifications for fireproof partitions.

49. *Bulletins*, 8½ x 11 in. Containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

CONTRACT AND ESTIMATE BLANKS

L. Fink & Sons Printing Co., Laurel Spring, N. J.

166. *Samples* of contract sheets, estimate blanks, job tickets, time tickets, time sheets, wage receipts, etc., with prices.

DAMPERS AND ASH DUMPS (Fireplace)

Apex Fireplace Co., Urbana, Ill.

535. Send for mechanism blue print of fireplace damper construction. This describes a most ingenious device.

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

DAMPPROOFING—See also Waterproofing

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.

425. *Six-page folder*, describing the Nu-Tile 4-in-1 Shingle.

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

426. *Send for catalog* on the advantages of the Asbestos Shingle.

Cortright Metal Roofing Co., 50 No. 23rd Street, Philadelphia, Pa.

Illinois Zinc Co., 280 Broadway, New York.

428. *An eight-page folder*, describing the roof that is always new.

National Sheet Metal Roofing Co., 339 Grand St., Jersey City, N. J.

429. *68-page book*, illustrating the "Shingles That Last."

Rocbond Co., Van Wert, Ohio.

430. *An eight-page folder*, entitled, "Fortifies Your Home Against the Element of Time."

F. C. Sheldon Slate Co., Granville, N. Y.

431. *A 16-page illustrated booklet*, describing "The Most Enduring and the Most Attractive Roof at the Most Reasonable Cost."

DOOR CHECKS

Park Manufacturing Co., Worcester, Mass.

50. *Catalog* contains description of six models of the new improved Worcester-Blount Door Check.

DOORS AND WINDOWS

American 3-Way Luxfer Prism Co., 1309 So. 55th Street, Cicero, Ill.

Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.

432. *A 32-page catalog*, describing "Window Walls," their cost and their advantages.

Henry Hope & Sons, 103 Park Ave., New York.

51. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¼ x 18½ in. 32 pp.

Truscon Steel Company, Youngstown, Ohio.

52. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.

53. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill.

DOOR AND WINDOW FRAMES

Andersen Lumber Company, South Stillwater, Minn.

55. *General Catalog* for architects, contractors, engineers, carpenters or builders. Describes and illustrates fully Andersen Standard White Pine Window, Cellar Frames, Sash Frames and Door Frames. Gives details of construction, variety of sizes and uses for ordinary as well as special construction, and method of assembly. Size 7¾ x 10¾, 24 pages.

56. *Better Frames for Less Money* for consumers. Interesting folder showing advantages of Andersen Standard White Pine Frames. Uses, sizes and details of construction.

Casement Hardware Co., 250 Pelanze Bldg., Chicago, Ill.

DRAFTING MATERIALS

A. S. Aloe Company, 513 Olive Street, St. Louis, Mo.

433. *A 116-page book*, describing the advantages of "Direct-by Mail" Buying.

Eugene Dietzgen Co., 162 W. Monroe Street, Chicago, Ill.

Keuffel & Esser Co., Hoboken, N. J.

434. *A 486-page Bound Book.* This is the thirty-sixth edition of the catalog.

Peerless Blue Print Co., 347 Fifth Avenue, New York City.

Warren-Knight Company, 136 No. 12th Street, Philadelphia, Pa.

435. *36-page booklet*, describing the "Sterling" Transits and Levels.

DUMBWAITERS

Kimball Bros. Co., 1106 Ninth Street, Council Bluffs, Iowa.

436. *30-page illustrated catalog*, describing the various models of Dumbwaiters.

Sedgwick Machine Works, 156 W. 15th Street, New York.

57. High grade Hand Power Elevators and Dumbwaiters for All Purposes. Illustrated catalog, 52 pages; dumbwaiter service sheet, and pamphlets descriptive of many special types of outfits.

ELECTRICAL EQUIPMENT

Arrow Electric Co., Hartford, Conn.

General Electric Co., Schenectady, N. Y.

513. *Wires and Cables.* Booklet, 8 x 10½ in. 85 pp. Illustrated. Four bulletins in a binder, describing wires and cables in general, conductors insulated with vulcanized rubber compound, varnished cambric and paper insulated cables, splicing materials and junction boxes for cable installations, armored cables.

514. *Electric Fans.* Folder, 6 pp. 3¼ x 6 in. Illustrated. Describes 1922 line of electric fans, giving catalog numbers, voltages and frequencies.

515. *Reliable Wiring Devices.* Catalog. 3 x 4⅝ in. 206 pp. Illustrated. Pocket catalog giving prices, schedule classifications and data for socket receptacles, switches, rosettes, cutouts and fuses for miscellaneous devices.

516. *Lighting of Public Buildings.* Bulletin. 6 x 9 in. 25 pp. Illustrated. Describes lighting of galleries, banks, museums, libraries, municipal, county and state buildings.

ELECTRIC METER BOXES

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

ELEVATORS

C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.

Kimball Brothers Company, Council Bluffs, Iowa.

58. *Kimball Elevators.* An illustrated catalog of band power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7¾ x 10½ in.

BRASS PIPE

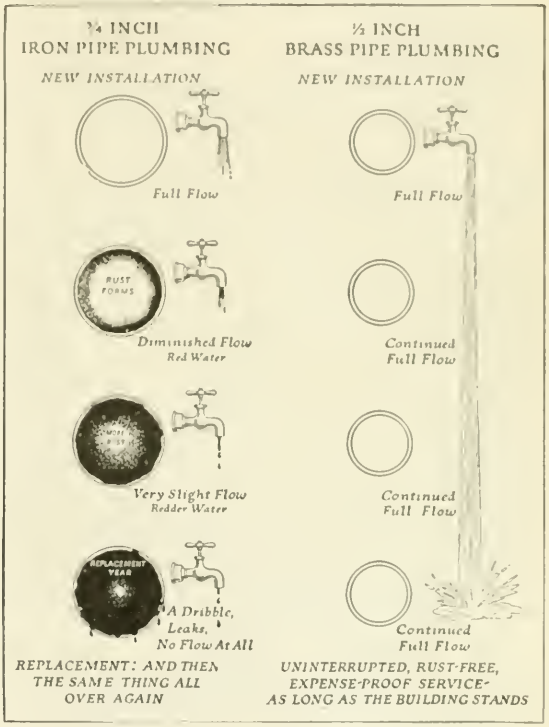
at Almost the First Cost of Iron

WRITING in the Plumbers Trade Journal, Mr. T. N. Thomson, sanitary engineer, compares the sizes of iron and Brass pipe required to carry the same volume of water and presents a table of sizes which, when filled in with prices by the estimator, gives a Brass installation at a cost so little in excess of iron that the difference may be ignored.

To illustrate at a glance the basis for Mr. Thomson's calculations we have prepared the diagram which appears on this page.

Deterioration of iron pipe begins the day it is made and progresses in service until the iron pipe becomes completely clogged with rust.

This corrosion, which is particularly acute in the hot water supply lines, not only discolors the water but greatly reduces or stops delivery at the fixture, and also eats away the pipe wall to such an extent that in many instances leaks



appear within six years and force a renewal of the piping.

On the other hand, Brass pipe delivers at the end of any number of years of service as much water as it does on the day it comes from the mill.

Reprints of Mr. Thomson's article are available upon request to the Association.

Saving in Pipe Size by Use of Brass

From many years' experience on a variety of work, it would appear that reasonable differences in diameter for street service and cold water lines are as follows:

½	inch	Brass	instead of	¾	inch	iron
¾	"	"	"	1	"	"
1	"	"	"	1¼	"	"
1¼	"	"	"	1½	"	"
1½	"	"	"	2	"	"
2	"	"	"	2½	"	"

For hot water lines, the following appear reasonable:

½	inch	Brass	instead of	1	inch	iron
¾	"	"	"	1¼	"	"
1	"	"	"	1½	"	"
1¼	"	"	"	2	"	"
1½	"	"	"	2½	"	"
2	"	"	"	3	"	"

"Copper and Brass are cheaper because you pay for them only ONCE"

COPPER & BRASS
RESEARCH ASSOCIATION
25 Broadway - New York

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 72*

Richards-Wilcox Mfg. Co., Aurora, Ill.
59. *Vertical Elevator Door Equipment.* Catalog showing elevator door hangers for one, two or three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.

Sedgwick Machine Works, 156 West 15th Street, New York.
517. *Catalogs and descriptive Pamphlets.* 4¼ x 8¼ in. 70 pp. Illustrated. Descriptive pamphlets on hand power freight elevators, sidewalk elevators, automobile elevators, etc.

ENGINES—GASOLINE

New-Way Motor Co., Lansing, Mich.
437. *Write for helps and suggestions.*

FACTORY EQUIPMENT

The Edwards Mfg. Co., Cincinnati, Ohio.
60. *Edwards' Steel Equipment.* Illustrated catalog. Showing steel lockers and shelving for factories, offices, stores, schools and hospitals, together with illustrations and description of "Edmanco" steel office furniture and filing cabinets. Size 8 x 11 in. 32 pp.

FIREPLACES AND MANTELS

Apex Fireplace Co., Urbana, Ill.
503. *An interesting four-page folder* with blue prints attached.

Colonial Fireplace Company, 4611 West Roosevelt Road, Chicago, Ill.
520. *Fireplace Equipment.* A catalog and price list of andirons, modern dampers, fenders, fire-sets, screens, thresholds, etc., etc., together with valuable information about the proper construction of fireplaces. 20 pp. Ill. 8½ x 11 in.

Muller Co., Franklyn R., Waukegan, Ill.
519. *Asbestone Composition Flooring.* Circulars. 8½ x 11 in. Description and Specifications.

Strait & Richards, Inc., Newark, N. J.
62. *Catalog* describing fireplaces, electric and gas logs, heating supplies, heaters, etc.

FLOOR HARDENERS

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
61. *Agatex and its Performances.* Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FLOORING, LUMBER

The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
63. *The Perfect Floor.* Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5⅛ x 7⅝ in.

Oak Flooring Advertising Bureau, 1014 Ashland Block, Chicago, Ill.
64. *Modern Oak Floors.* Booklet. 6¼ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
65. *Oak Flooring, How and Where to Use It.* Booklet. 3¼ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.
257. *Oak Flooring for Factories and Warehouses.* Booklet. 3¼ x 6 in. 16 pp. Illustrated. Small general book featuring No. 2 Common Oak Flooring for hard usage in factories and warehouses, with testimonials.

Pacific Lumber Co., 2070 McCormick Bldg., Chicago, Ill.
438. *A sixteen-page treatise* on the construction Digest of Information on the Values and Uses of Redwood.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
66. *Gypsum Poured Steel Reinforced.* Loose-leaf bulletins. 8½ x 11. Pyrofill.

Wood Mosaic Co., New Albany, Ind.
227. *Catalogue* of wood-carpet, strips, plain and ornamental parquetry, tongue and groove flooring in natural wood colors.

FLOORING, COMPOSITION

Everlasbestos Flooring Co., Rochester, N. Y.
439. *Sixteen-page illustrated booklet,* describing the really modern floor.

Muller Co., Franklin R., Waukegan, Ill.
521. *Asbestone Flooring Composition.* A book describing uses of and giving specifications and directions for Composition Flooring, Base, Wainscoting, etc. 8½ x 11 in. Ill.

FLOOR SURFACING MACHINERY

Amer. Floor Surfacing Machine Co., 521 So. St. Claire Street, Toledo, Ohio.
440. *An eight-page illustrated booklet,* describing the "American Universal." Also opportunities of making money in the "American Universal Way."

Waywell Chappell & Co., 137 No. Jackson Street, Waukegan, Ill.
441. *Four-page folder,* describing the "Little-Automatic Electric Surfacing Machine."

M. L. Schlueter, 223 W. Illinois Street, Chicago, Ill.
442. *Eight-page illustrated folder,* the various "Improved Schlueter" Floor Surfacing Machines.

FLOOR VOIDS FOR USE IN CONCRETE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.
67. *Loose-leaf Bulletins.* 8½ x 11. Pyrobar Gypsum Floor Tile.

FURNACES—See Heating Equipment

GARAGE CONSTRUCTION

McKinney Mfg. Co., Pittsburgh, Pa.
283. *Interesting 16-page Catalog,* describing the complete hardware for various types of Garage Doors.

National Mfg. Co., Sterling, Ill.
248. Catalog of Garage Hardware.

Richards-Wilcox Mfg. Co., Aurora, Ill.

GARBAGE DESTROYERS

Kerner Incinerator Company, 1027 Chestnut St., Milwaukee, Wis.
68. *The Sanitary Elimination of Household Waste.* M-3 Folder. Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. 4 x 9 in.

GARBAGE RECEIVERS

The Donley Bros. Co., 3700 East 74th Street, Cleveland, Ohio.

GARMENT HANGERS

Knape & Vogt, Grand Rapids, Mich.
405. An interesting booklet describing the "Garment Care System."

GLASS

American Window Glass Co., Pittsburg, Pa.
69. Send for circular describing different varieties of window glass and how to select the proper kind.

American Three-Way Luxfer Prism Co., Cicero (Chicago), Ill.
70. Write for details and prices of glass prisms that will project daylight into dark interiors.
71. Other literature with reference to apartment house installations.

Plate Glass Mfgs. of America, 1st Nat'l Bank Bldg., Pittsburgh, Pa.
443. *Several folders,* describing the necessity of Plate Glass.

GYPSUM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

HARDWARE

Bridgeport Chain Co., Bridgeport, Conn.
444. *Catalog No. 14.* A 68-page illustrated book, describing an extensive line of chains, stampings and wire.

Caldwell Mfg. Co., 5 Jones Street, Rochester, N. Y.
445. *Sixteen-page illustrated catalog,* entitled "Suggestions for the Present-Day Architect."

Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.
446. *Illustrated catalog and price list* of "Casement Window Specialties."

Griffin Mfg. Co., Erie, Pa.
447. *Seventy-six page illustrated book,* cloth bound, entitled "Hinges."

Hess Warming & Ventilating Co., 1204 Tacoma Bldg., Chicago, Ill.
240. *24-Page Illustrated Catalog.* 4 x 6 in. Describing the Sanitary Medicine Cabinet, Lockers and Lavatory Mirrors.

H. B. Ives Co., New Haven, Conn.
448. *Write for their illustrated folder,* describing hardware, window and door specialties.

The Kawneer Co., Niles, Mich.
72. *Kawneer. Simplex Window Fixtures.* Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½ x 10¾ in. 16 pp.

Knape & Vogt Mfg. Co., Grand Rapids, Mich.
73. Garment Hangers. Send for illustrated booklet.

McKinney Mfg. Co., Pittsburgh, Pa.
449. *McKinney's "Complete Garage Sets,"* an interesting illustrated eight-page folder.

Monarch Metal Products Co., 5020 Penrose Street, St. Louis, Mo.
522. *Monarch Casement Hardware.* A book describing hardware for casement windows. This Manual and folder comply with all suggestions made by the Structural Service Committee of the A. I. A. 18 pp. Ill. 7½ x 10½ in., in heavy folder for vertical file properly indexed.

F. E. Myers & Bro. Co., Ashland, Ohio.
450. *Catalog,* describing the No. 30 Simplex Garage Door Hanger

National Mfg. Co., Sterling, Ill.
451. *An interesting illustrated catalog* on "Garage Hardware."

Richards-Wilcox Mfg. Co., Aurora, Ill.
75. *Modern Hardware for Your Home.* Catalog of hangers for sun varnishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Sidetite" garage door hardware. 24 pp. Illustrated. 8½ x 11 in.

Sargent & Company, New Haven, Conn.
452. *Sixty-six-page illustrated booklet* on "Planes."
453. *Thirty-six-page illustrated booklet* on "Standard Steel Squares."

The Stanley Works, New Britain, Conn.
76. *Wrought Hardware.* New 1921 catalog. This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 676 pp. Illustrated. 6½ x 9½ in.
77. *Garage Hardware.* Booklet, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustration and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.
78. *Eight Garages and Their Stanley Hardware.* Booklet. Plans, drawings and complete hardware specifications. Size 5 x 7 in.
79. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in.
523. *Stanley Detail Manual.* A catalog in loose leaf binder, consisting of five sections on Butts, Bolts, Blind and Shutter Hardware, Stanley Garage Hardware, Screen and Sash Hardware. Detail drawings are given, showing clearness and other data needed by detailers. 116 pp. Ill. 7½ x 10½ in.

HEATING EQUIPMENT

Bowman Supply & Mfg. Co., 886 Progress St., Pittsburgh, Pa.
513. Write for the permanent catalog. It is an excellent reference book.

Co-operative Foundry Co., Rochester, N. Y.
454. *Sixteen-page illustrated booklet,* describing the "Red Cross Empire Pipeless Furnace."

Economy Heater Co., 108 S. La Salle St., Chicago, Ill.

The Farquhar Furnace Company, Wilmington, Ohio.
80. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Illustrated. 4¾ x 9¼ in.
81. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating and layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Illustrated. 8½ x 11 in.

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.
455. *Handy-Man Book,* or Plumbing and Heating Encyclopedia. Price 50c.

Hess Warming & Ventilating Co., 1205D, Tacoma Building, Chicago, Ill.
82. *Modern Furnace Heating.* Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.

Be a Floor Surfacing Contractor

Make $5,000 to $15,000 or More Yearly

The American Universal Floor Surfacing Machine is the best money maker the contractor can own. It is practically "fool proof" and can be operated by any man of ordinary ability and do only the best grade of work, for its operation is automatic. When your building is about ready to turn over to the owner, it does the last big job, the floors, when everyone is anxious, quickly and perfectly, leaving everyone feeling satisfied. One man and one American Universal does the work of six men and does it perfectly.

Old Floors Made Like New—New Floors Made Perfect



Contractors owning American Floor Surfacing Machines keep them going all the time at big profits on old floors when they are not needed on the new work—this is an excellent source of profits. Often, too, floor surfacing contracts are taken on other jobs. Just read what users say about the labor-saving, money-making ability of the American Universal. Hundreds of others have gone into the floor surfacing business and are independently well fixed.

Saves Labor of Six Men and Does Better Work

We can surface more floor with our "American Universal" machine than six men can scrape by hand, considering the quality of the work.—Schneider & Hein, Nebr.

Would Not Go Back to Old Way

The "American Universal" is a great labor saver, doing the work of about eight men, so naturally I would never consider going back to hand scraping again.—M. R. Warner, Colo.

Surfaces 1500 Square Feet Per Day

The "American Universal" does all you claim, for it has surfaced 1500 square feet of flooring per day for me and is doing the work of six men.—L. F. Walla, Va.

Customers Satisfied—Business Increases

The "American Universal" has replaced five men at least on my payroll, does better work than before, and so, as my customers are so well pleased, I have found my business increasing right along.—A. G. Thompson, Ark.

Afraid to Go Back to Hand Work

Since the "American Universal" has proven such a great labor saver, would not dare to go back to the old method of hand scraping.—C. E. Andrews, Pa.

Saves Six Men

The "American Universal" replaces six men on my pay roll and I find it to be a great labor saver.—E. A. Bittner, Pa.

Light and Easy to Handle

In the first place the "American Universal" machine is light and easy to handle and does lots more work than the other sander of a different make which I have.—Kroffganz and Frank, Mont.

No Kick—Replaces Six Men

Want to tell you that I've never had a kick about unsatisfactory work from any of my customers ever since I bought the "American Universal" and it replaces six men on my pay roll, too.—A. F. Grow Brothers, Nebr.

Saves Ten Men

Your "American Universal" floor surfacing machine is a labor saver. It will do the work of ten men in one and in much better shape.—M. B. Battien, S. D.

Replaces 10 Men

The "American Universal" replaces ten men on my pay roll, and surely does excellent work.—I. O. Fetter, Pa.

Machine Does Better Work Than Hand Scraping

The "American Universal" has replaced five men on my pay roll, and I can do a better quality of work with my machine, than by hand scraping.—L. L. Howard, Kans.

Quality of Work Only Advertisement Necessary to Secure More Work

I want to tell you that the "American Universal" is some labor saver—it replaces at least five men on my pay roll, and the quality of work it turns out is all the advertisement I need for my business.—Hugh A. Cox, Fla.

1 man with an American Universal—Big Profit
6 men surfacing by hand—Small Profit
How are you running your business?



The American Floor Surfacing Machine Company

521 So. St. Clair Street — *Originators of Floor Surfacing Machines* — **Toledo, Ohio**

THE AMERICAN FLOOR SURFACING MACHINE CO.,
521 So. St. Clair St., Toledo, Ohio.

Gentlemen: Please send me without obligation to me complete information and literature on your proposition. The following information will no doubt assist you in advising me:

( ) I want to become a Floor Surfacing Contractor.
( ) I am not now a contractor of any kind but was in the following business .....
( ) I am a Building Contractor and want to use it on my own contracts.

Name .....Street .....City .....State .....

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 74*

B. Karol & Sons Co., 802 So. Kedzie Avenue, Chicago, Ill.
Kelsey Heating Company, James Street, Syracuse, N. Y.
83. *Booklet No. 5.* 4 x 9, 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.
84. *Monroe Pipeless Booklet.* 4½ x 8 in. 20 pp. Illustrated.
85. *Monroe Tubular Heater.* Booklet. 4½ x 8 in. 20 pp. Illustrated General Booklet giving capacities, dimensions, weights, etc.
86. *Syracuse Pipeless Booklet.* 4½ x 8 in. 12 pp. Illustrated. General Booklet giving sizes and capacities.
87. *Valves, Syphons and Traps.* A series of pamphlets to enclose in envelopes, describing the well known Thermostatic Return Line Valves and other heating equipment specialties made by this company.
Magee Furnace Co., Boston, Mass.
Strait & Richards, Inc., Newark, N. J.
88. *Catalog* describing fireplaces, electric and gas logs, heaters, etc.

HINGES—See also Hardware.
Griffin Mfg. Co., Erie, Pa.
McKinney Mfg. Co., Pittsburgh, Pa.
456. *Complete Garage Sets* for all types of hinges. An interesting 8-page folder.
The National Mfg. Co., Sterling, Ill.
The Stanley Works, New Britain, Conn.

HOISTS—See Elevators
American Saw Mill Machinery Co., Hackettstown, N. J.
89. *Bulletin No. 10* describing several kinds of builders' hoists.
C., H., and E. Mfg. Co., Milwaukee, Wis.
90. *Bulletin No. 3.* Hoists and Mortar Mixers.

HOLLOW TILE
Fiske & Company, Boston, Mass.
457. *Sixteen-page illustrated booklet,* entitled "Through the Home of Tapestry Brick."
458. *Sixteen-page illustrated booklet,* entitled "Tapestry Brick and Tile Work for Floors and Interior Walls."
Hollow Building Tile Association, Chicago, Ill.
459. *Write* for the "Handbook of Hollow Building Tile Construction." This is an interesting and helpful book.
460. *Seventy-page book,* called "Hollow Building Tile Manual for Builders and Masons," is of vast importance.
National Fire Proofing Co., Pittsburgh, Pa.
461. *Several interesting booklets can be procured,* namely: "Natco on the Farm," "Natco Grain Bins, Corn Cribs and Storage Bins," "Fire Proof Buildings of Natco Hollow Tile," "Bulletin No. 171, Standard Fire Proofing."

HOUSE MOVING
La Plante Choate Co., Cedar Rapids, Iowa.
510. *Descriptive Catalog of House-moving Appliances.*

INCINERATORS—See Garbage Destroyers

INSULATION
Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
92. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bisphopric Stucco-Board and Bishopric Sheathing Board.
Samuel Cabot, Inc., 141 Milk St., Boston, Mass.
249. Cabot's Quilt. Catalog containing drawings and description.
U. S. Mineral Wool Co., 280 Madison Avenue, New York, N. Y.
94 *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼ x 6⅜ in.

JOISTS AND STUDS, PRESSED STEEL
General Fireproofing Co., Youngstown, Ohio.
462. *An interesting booklet,* called "Industrial Housing," has the actual blue prints in it.
Central Pressed Steel Co., Massillon, Ohio.
96. *Descriptive 4-page folder* on metal lumber for building construction.
Truscon Steel Company, Youngstown, Ohio.
95. *Truscon Steel Joists.* Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

KITCHEN EQUIPMENT
Bisk Corp., Brockton, Mass.
463. *Several interesting booklets,* describing the various types of "Built-In-Kitchens." These are illustrated by actual blue prints.
National Mill & Lumber Co., 2 Rector Street, New York.
277. *10-Page Illustrated Folder.* Describes the necessity and advantages of a National Built-In Ironing Board.

LATH, METAL AND REINFORCING
The Bisphoric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.
Bostwick Steel Lath Co., Inc., Niles, Ohio.
279. *"Beautiful Permanent Walls."* 22-page illustrated catalog. 4 x 9 inches.
Central Pressed Steel Co., Massillon, Ohio.
General Fireproofing Co., Youngstown, Ohio.
97. *Catalog* describes Herringbone Rigid Metal Lath, how it is applied and used, with detailed drawings, specifications, etc.
Truscon Steel Co., Youngstown, Ohio.
99. *Hy-Rib and Metal Lath.* 18th Edition. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

LEVELS and TRANSITS
Beckmann & Co., A., 1004 Jackson St., Toledo, Ohio.
Aloe, A. S., Co., 513 Olive Street, St. Louis, Mo.
524. *Write at Once* for this interesting booklet describing levels and rules.
Eugene Dietzgen Co., 162 W. Monroe St., Chicago, Ill.
Keuffel & Esser Co., Hoboken, N. J.
Lufkin Rule Co., Saginaw, Mich.
Warren-Knight Company, 136 North 12th St., Philadelphia, Pa.
100. *"Sterling" Levels and Transits.* 32 pp. illustrated catalog. Description, specifications and structural advantages required in modern practice for establishing lines, levels, angles, etc. Vest Pocket Manual of adjustments.
David White Co., 907 Chestnut Street, Milwaukee, Wis.
464. *Catalog A,* "White's Improved Instruments," is a 36-page booklet with a hard cover and illustrated.

LIGHTING
American Three-Way Prism Co., 1307 South 55 Court, Cicero, Ill.
98. *Descriptive Circular* on the use of prisms for directing light to dark corners.

LIGHTNING RODS
E. G. Washburne Co., 207 Fulton Street, New York.
232. *Descriptive Catalog in Colors.* Showing different designs of weather vanes, lightning rods, ventilators, etc.

LUMBER
Arkansas Soft Pine Bureau, 802 Boyle Building, Little Rock, Ark.
101. *Arkansas Soft Pine Handbook.* Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Moulding Designs.
102. *The Home You Long For.* Booklet. 8¼ x 11. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.
Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
104. *The Post Everlasting.* Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.
228. *Poles That Resist Decay.* Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.
105. *"From Tree to Trade,"* a 48-page illustrated description of the manufacture of lumber from tree to use. Describes methods of logging, construction, etc.
Pacific Lumber Company of Illinois, The, 1105 Lumber Exchange Building, Chicago, Ill.
106. *Engineering Digest.* Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipes, Outbuildings, Irrigation Flumes, Drainage Boxes, Greenhouses, etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.
Southern Cypress Mfrs. Assn., 1227 Poydras Bldg., New Orleans, La.
107. *Many interesting booklets* on the use of Cypress for all purposes.

LUMBER ASBESTOS
Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
108. *Ambler Asbestos Building Lumber.* Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½ x 11 in.

MARBLE, ARTIFICIAL
Art Stone Co., Waynesboro, Pa.
METAL LATH—See Lath, Metal and Reinforcing

METALS AND METAL BUILDING SPECIALTIES
American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.
111. *Reference book. Pocket Edition.* 2½ x 4½ in. 168 pp. Illus. Covers the complete line of Sheet and Tin Mill Products.
113. *Apollo and Apollo-Keystone Galvonized Sheets.* Catalog. 8½ x 11 in. 20 pp. Illustrated.
114. *Research in the Corrosion Resistance of Copper Steel.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.
115. *Facts Simply and Briefly Told.* Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.
116. *Black Sheets and Special Sheets.* Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, building tables, etc. Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.
Bridgeport Brass Company, Bridgeport, Conn.
525. *Seven Centuries of Brass Making.* Booklet. 10½ x 8 in. 78 pp. Illustrated in color. A brief history of the ancient art of Brass Making and its early (and even recent) method of production—contrasted with that of the Electric Furnace Process—a twentieth century achievement of the Bridgeport Brass Company.
526. *Tested High-Speed Brass Rod.* Booklet. 10½ x 8 in. 16 pp. Illustrated. Short treatise on the manufacture of Brass Rod for use in Screw Machines, with particular reference to improvements originated by the Bridgeport Brass Company.
527. *Handbook for Architects, Engineers & Superintendents.* Book 7½ x 4 in. 100 pp. Illustrated. Descriptive catalog of the products of the Bridgeport Brass Company, prepared especially for architects, engineers and superintendents, fully illustrated, and containing much valuable information.
Copper & Brass Research Association, 25 Broadway, New York, N. Y.
528. *How to Build a Better Home.* Booklet. 7¼ x 10½ in. 30 pp. Illustrated. A book on building written for the prospective builder. Contains keyed illustrations of houses and details of houses and should be of value to architects in dealing with clients.
The Donley Bros. Co. 7400 East 74th Street, Cleveland, Ohio.
237. *28-Page Illustrated Catalog* on "Donley Devices and Building Specialties" 6 x 9 in.
N. & G. Taylor Co., Philadelphia, Pa.
117. *Booklet and Detail Sheet of Tin Roofing.* See Roofing.
METAL TRIM—See Doors, Windows and Metal



Building "On the Boom" Means Big Jobs for *Trained* Men

Every man whose eyes are open realizes that there are bigger opportunities for building experts today than ever before. Everywhere we see construction of all kinds going on—houses, mills, factories, stores, bridges, warehouses—all needing men to plan the work and men who have the training which enables them to direct those who do the manual labor. The big pay goes to the ones who do the thinking and carry the responsibilities. And everywhere we hear the call going out for more of these **trained men.**

No man can complain today that he "hasn't a chance." Every man who is an expert in any branch of building can get all that his services are worth, and he will find opportunities looking for him.



That man who "isn't getting ahead" is the man who isn't trained to do bigger things. There is a price for each class of ability—and business will pay no more.

As long as a man is willing to mix mortar, lay brick, chisel stone, drive nails, string wires, wipe joints or do other manual work he will be limited to the prevailing scale of wages.



As long as a contractor is satisfied with taking on small jobs he will see the large profits go to men who know how to handle the big jobs. That is why ambitious men are training—getting the knowledge which makes their services worth more. They know that brains always command more money than muscle or skill of hand.

For over twenty years Chicago Technical College has been helping this kind of men to advance—to get where they draw the high salaries or make the big profits that are paid to experts.

Hundreds of these ambitious men have stepped into the big pay class while their fellow workmen remained at the bench.

There, for instance, is J. D. Woodside, of Oklahoma, who was working for $6 a day, who took the Chicago "Tech" Builder's Course and in 3 months was foreman on a big apartment building at $8 a day, 5 months later was superintendent on a reinforced concrete job covering nearly half a block, and is now in business as a contractor.



There, also, is S. J. Dickerson, of Rhode Island, who writes that his Chicago "Tech" training raised his income from $50 a month to $150 a week. And A. C. McEvoy, of Chicago, quickly advanced from a bricklayer to foreman as a result of taking this instruction.

These are only three out of the hundreds of forward-looking men who saw what this training would do for them and who got it.

Chicago "Tech" is ready to give you the same training in **Plan Reading, Estimating, Superintending.** Our Builder's Course makes **building experts**—men who know every practical point about planning, figuring costs and directing all classes of construction.

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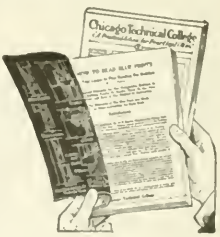
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SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 76*

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.

118. *Clinton Mortar Colors.* Booklet. 3½ x 6⅜ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

PACKAGE RECEIVER

The Donley Bros., 7001 East 74th Street, Cleveland, Ohio.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Samuel Cabot, Inc., Mfg. Chemists, 141 Milk Street, Boston, Mass.

534. *Cabot's Creosote Stains.* Description of a standard stain for shingles, siding, boarding and timbers, with covering capacity and specifications. 16 pp. 4 x 8½ in.

S. C. Johnson & Son, Racine, Wis.

122. *The Proper Treatment for Floors, Woodwork and Furniture.* Booklet. 6½ x 8⅝ in. 32 pp. Illustrated in colnr. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.

123. *Portfolio of Wood Panels.* 5½ x 10¾ in. 14 pp. Containing actual panels of finished woods. Also contains valuable information of finishing and re-finishng floors and woodwork.

John Lucas & Co., Inc., Philadelphia, Pa.

264. *100-Page "Descriptive Catalog."* 6 x 9 in. Published for the purpose of familiarizing "Lucas" distributors with the characteristics, purposes and uses of "Lucas Paints and Varnishes."

National Lead Co., 111 Broadway, New York City.

124. Handy Book on Painting. Book 5½ x 3¼ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal, etc., both interior and exterior.

Ripolin Co., The, Cleveland, Ohio.

256. *Ripolin Specification Book,* 8 x 10¼ in., 12 pp. Complete architectural specifications and general instructions for the application of Ripolin, the original Holland Enamel Paint. Directions for the proper finishing of wood, metal, plaster, concrete, brick and other surfaces, both interior and exterior, are included in this Specification Book.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

131. *Spread the Sunshine Inside.* Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories.

PARTITIONS

Richards-Wilcox Mfg. Co., Aurora, Ill.

529. *Partitions.* Booklet. 7 x 10 in. 32 pp. Illustrated. Shows complete line of tracks and hangers for all styles of sliding, parallel, accordion and flush door partitions.

PARTITION SYSTEM

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

133. *Loose leaf bulletins,* 8½ x 11 in. Jester-Sackett, consists of plaster board applied to metal channels with special clip, ready for plastering.

PARTITION TILE

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

134. *Fireproof.* 32-page booklet, 8½ x 11 in., including description, specifications, and working details of Pyrobar partition tile.

PERGOLAS

Hartman-Sanders Co., Elston and Webster Avenues, Chicago, Ill.

235. *Album No. 33.* 7½ x 10½ in. 42 pages of illustrated literature regarding the various types of Pergolas.

PLASTER BASE (See also Stucco Base)

PLASTER BOARD

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

133. *Pamphlets,* describes Sackett Plaster Board used instead of wood or metal lath.

PLASTER INTERIOR

National Kellastone Co., 155 East Superior Street, Chicago, Ill.

PLUMBING EQUIPMENT

Bowman Mfg. Co., 880 Progress Street, Pittsburgh, Pa.

512. Leather bound, profusely illustrated catalog of 84 pages describing the entire line of plumbing and heating equipment.

Bridgeport Brass Co., Bridgeport, Conn.

530. *Plumbing Supplies.* Catalog of adjustable swivel traps; basin and bath supplies and waste; basin and sink plugs; low tank bends; iron pipe sizes of brass pipe. 20 pp. Ill. 8 x 10½ in.

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

Hess Warming & Ventilating Co., 1205D Tacoma Bldg., Chicago, Ill.

136. *Hess Sanitary Steel Medicine Cabinets.* Booklet, 4 x 6 in.

B. Karol & Sons Co., 806 So. Kedzie Avenue, Chicago, Ill.

465. *Write for Catalog K,* describing the complete line of Plumbing and Heating Supplies.

PUMPS

C. H. & E. Mfg. Co., Milwaukee, Wis.

251. Bulletin No. 2 Pumps.

The F. E. Myers & Bro. Co., Ashland, Ohio.

137. *General Catalog.* 6 x 9 in. 392 pages. Shows complete line of Myers Products—Pumps for Every Purpose, Hay Tools, Door Hangers, Store Ladders, etc. Of particular interest to hardware and implement dealers; plumbers, architects, contractors and builders; mill, mine, factory and railway superintendents and purchasing agents; highway contractors and builders.

138. *Catalogs.* 6 x 9 in. Devoted to separate lines: No. 55, Pump—Hand and Power Pumps; No. PP-55, Power Pumps; No. HT-55, Hay Tools, Door Hangers and Store Ladders; No. HP-22, Hydro-Pneumatic Pumps, Electric House Pumps, Direct Water Systems; No. SOP-21, Self-Oiling Power Pumps; No. MC-21, Cylinder and Working Barrels; No. SP-22, Spray Pumps and Spraying Accessories. All catalogs fully illustrated.

REFRIGERATION

McCray Refrigerator Co., 2264 Lake Street, Kendallville, Ind.

466. *Catalog No. 95*—Refrigerators for Residences.

467. *Catalog No. 53*—Refrigerators for Hotels, Restaurants, Clubs.

468. *Hospitals and Institutions.* Catalog No. 64—Market Coolers and Refrigerator Counters.

ROOF DECKS

Boyle, John, & Co., Inc., 116 Duane St., New York.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

139. *Loose leaf bulletins.* 8½ x 11. Describing Pyrobar Roof Tile, which is laid directly on purlins or tee irons, joints grouted, and is then ready for roof covering.

ROOFING MATERIALS

Amalgamated Roofing Co., 431 So. Dearborn Street, Chicago, Ill.

American Sheet & Tin Plate Company, Pittsburgh, Pa.

140. *"Better Buildings."* Catalog. 8½ x 11 in. 32 pp. Describing Corrugated and Formed Sheet Steel Roofing and Siding Products—Black, Painted and Galvanized; together with directions for application of various patterns of Sheet Steel Roofing in various types of construction.

112. *Copper—Its Effect Upon Steel for Roofing Tin.* Catalog 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

141. *Specifications and Price List.* Descriptive booklet. Details of Ambler Asbestos Cement Roofing Slates, "Century" Asbestos Shingles and Asbestos Corrugated Sheathings. Tables and drawings. Size 6 x 9 in. 44 pp.

142. *Ambler Asbestos Corrugated Roofing.* Catalog gives complete data for specifying, drawings, methods of applications, tables, etc. Size 8½ x 11 in. 20 pp.

Wm. L. Barrell Co. of N. Y., Inc., 50 Leonard Street, New York

143. *Prepared Canvas for Roofing.* Samples can be obtained on application. A canvas for every use.

Beaver Board Products Co., Inc., Buffalo, N. Y

469. *Illustrated catalog* will be sent on request.

Blue Ridge Slate Corp. Esmont, Va.

470. *Samples and catalogs* sent on request.

John Boyle & Co., Inc., 112-114 Duane Street, New York, N. Y.

154. *Boyle's Bayonne Roof and Deck Cloth.* List B 93. A prepared roofing canvas guaranteed waterproof for decks and the roofs and floors of piazzas, sun-parlors, sleeping porches, etc.

Copper & Brass Research Association, 25 Broadway, N. Y. City.

267. *"How to Build a Better Home."* 36-page illustrated catalog. 8 x 10½ in. This not only describes but teaches the prospective buyer the essential facts of building, finance, hardware and roofing.

34. *"Copper Roofing,"* a manual for architects and builders. Weights of various roofing materials. Up-to-date practise in the laying of copper roofs—Batten or wood rib methods, Standing seam method, Flat copper roofs, Copper shingles, Suggestions for avoiding error and obtaining the full value of copper. Decorative effects and how to obtain them. Flashings, reglets, gutters and leaders. Cornices. Copper-covered walls. Specifications. 32 pp. Ill. 8½ x 11.

Cortright Metal Roofing Co., Philadelphia, Pa.

236. Four-page circular describing the various shingles.

Creo-Dipt Company, 1025 Oliver Street, North Tonawanda, N. Y.

153. *Standard Stained Shingle.* Samples of different kinds mailed.

154. *Architectural Service Sheets.* 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.

Edward's Mfg. Co., 423 Eggleston Avenue, Cincinnati, Ohio.

471. *Catalog No.* 65 describes fully Metal Roofing, Siding, Ornamental Ceilings and other Sheet Metal Work. This is a 210-p. catalog well illustrated.

C. G. Hussey & Co., Pittsburgh, Pa.

227. *Copper Roofing and Flashings.* Book No. 6. 34 pp.

Illinois Zinc Company, 280 Broadway, New York, N. Y.

155. *"Izco," the Metal of Permanence."* 8-page, illustrated booklet describing the durability, service and maintenance cost of Corrugated Sheets of Pure Rolled Zinc.

156. *The Roof That's Always New.* Booklet. 3¾ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley ridge and hip piece.

National Sheet Metal Roofing Co., 339 GrandSt., Jersey City, N. J.

159. *Manufacturers of Metal Shingles* in various designs, both in painted tin or galvanized iron. Samples sent on request.

The Richardson Company, Lockland, Cincinnati, Ohio.

472. *Viskalt Membrane Roofs.* Contains specifications for applying Membrane roof over boards and also for applying over concrete. Illustrated with line drawings of several approved methods of flashings. 3 pp. 8½ x 11 in.

F. C. Sheldon Slate Co., Granville, N. Y.

473. *Sixteen-page colored catalog,* describing the "Most Attractive Roof at the Most Reasonable Cost."

N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.

160. *Selling Arguments for Tin Roofing.* Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.

United States Gypsum Company, 205 W. Monroe St., Chicago, Ill.

161. *Gypsum Poured, Steel Reinforced.* Loose-leaf bulletins. 8½ x 11. Pyrofill.

Vendor Slate Co., Easton, Pa.

474. *"A Book for Architects"* is the title of the new 24-page well-illustrated catalog. See also listing under Slate.

Vulcanite Roofing Co., Buffalo, N. Y.

475. *Interesting booklets,* describing the "Better Shingle" and "Vulcanite Roll Roofings."

Winthrop Tapered Asphalt Shingles, 19 So. La Salle St., Dept. No. N. D. 20, Chicago, Ill.



Roof stained with Cabot's Creosote Stains. Walls finished with Old Virginia White. Lined with Cabot's Quilt for warmth.
Prentice Sanger, Architect, New York

For Roofs, Siding, Timbers and all Other Outside Woodwork

Cabot's Creosote Stains

They have *proved* their merit in every climate for nearly forty years. The colors are soft, rich and harmonious; the Creosote penetrates the wood, preserves it, and makes it less inflammable. Shingles make the warmest and cheapest outside finish, and a shingled house stained with Cabot's Stains is the ideal, cozy American country home.

Cabot's Insulating Quilt

A scientific heat insulator and sound-deadener that makes houses warmer in winter and cooler in summer and deadens sounds in floors and partitions. Not a mere felt or paper, but a non-conducting mat that is about thirty times warmer than common papers.

You can get Cabot's Stains and Quilt all over the country. Send for samples and names of nearest agents.

SAMUEL CABOT, Inc., Mfg. Chemists
BOSTON, MASS.
342 Madison Ave., N. Y. 21 W. Kinzie St., Chicago
Cabot's Conservo Wood Preservative, Stucco Stains, Brick Stains, Damp-Proofing



Residence of Geo. H. Dakin, Grand Rapids, Mich.
Pierre Lindhomt—Architect.

Clinton Service

Clinton Mortar Colors are sold by dealers all over the country.

If by chance you are not able to locate a dealer in your town who carries them, wire us, and we will put you in touch immediately with a dealer close at hand from whom they may be obtained.

THE CLINTON METALLIC PAINT CO., Clinton, N. Y.

Clinton Mortar Colors

Nature's permanent colors. Made since 1867



TRUSS-LOOP is a Real Labor-Saver on Repair Work

In Two Ways—

First— It is not necessary to take off the old plaster—a dirty job. Where it is desired to replaster an old surface to cover cracks or gapping holes where the plaster has fallen from wood lath, simply nail BOSTWICK TRUSS-LOOP over the old plastered surface.

Second—No furring strips are necessary with TRUSS-LOOP. With the loops turned in there is plenty of furring space and a good plaster key is secured.

There's real satisfaction in making wall and ceiling repairs with BOSTWICK Truss-Loop because of the satisfaction it gives your customer.

Write for pocket sample—and catalog.

THE
BOSTWICK STEEL LATH CO.
NILES, OHIO

Bostwick "TRUSS LOOP"

SELECTED LIST OF MANUFACTURERS' LITERATURE—*Continued from page 78*

RULES

A. S. Aloe, St. Louis, Mo.
A. Beckmann Co., 104 Jackson St., Toledo, Ohio.
Eugene Dietzgen Co., 162 Ft. Monroe Street, Chicago, Ill.
476. *Write for an instructive circular.*
Keuffel & Esser, Hoboken, N. J.
Lufkin Rule Co., Saginaw, Mich.
Sargent & Co., New Haven, Conn.
Stanley Rule & Level Co., New Britain, Conn.

SASH CHAINS, HOOKS AND ATTACHMENTS

The Bridgeport Chain Co., Bridgeport, Conn.
209. *An interesting catalog* describing fully Sash Chain in Steel (six sizes and six finishes), in Bronze (six sizes), Hooks and Sash Chain Attachments.

SASH—(See Windows)

SASH CORD

Samson Cordage Works, Boston, Mass.
477. *An interesting catalog* with actual samples of the various grades of cordage therein.

SAW MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.
162. *Catalog No. 21,* describing Circular Saws of all sizes.
163. *General Catalog No. 22* and *special Bulletin No. 77,* describing sawing machinery for use on the job in the shop.
W. F. & John Barnes Co., 71 Ruddy Street, Rockford, Ill.
478. *Catalog No. 84* describes in full detail the Patent Foot and Hand Power Wood Working Machinery.
C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
164. *Bulletin No. 1, Saw Rigs.*
Crescent Machine Co., 206 Main Street, Leetonia, Ohio.
479. *This* 1921 *catalog* contains improvements on No. 3 and No. 5 Saw Tables No. 2 Motor-Driven Saw Table, New Motor-Driven Sharper, Hollow Chisel Mortiser.
Huther Bros., B. F., Saw Mfg. Co., Rochester, N. Y.
480. *Catalog No. 84* describes the complete line of Saws.
Parks Ball Bearing Machine Co., Station A, Cincinnati, Ohio.
482. *Catalog B* describes in detail Wood Working Machines.
Sidney Machine Tool Co., Sidney, Ohio.
483. *Twelve-page illustrated booklet,* describing the "Famous Universal Wood Workers."
484. *One hundred-page pocket-size catalog,* giving full information on the "Famous Woodworking Machinery."

SAWS

E. C. Atkins Co., Indianapolis, Ind.
286. Booklet and chart describing saws. Especially the cross cut saw.
Huther Bros., B. F., Saw Mfg. Co., Rochester, N. Y.

SCREENS

American Wire Fabrics Company, 208 So. La Salle St., Chicago, Ill.
165. *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enamel, galvanized, galvanoid, American bronze. 30 pp. Illustrated. 3½ x 6¼ in.

SHEATHING

Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
171. *Homes Built on the Wisdom of Ages.* Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.
U. S. Gypsum Company, 205 West Monroe St., Chicago, Ill.
173. *Eight-page Folder.* Describes Adamant Sheathing Board for use instead of wood sheathing.

SHINGLES—ASPHALT

Winthrop Tapered Asphalt Shingles, 19 So. La Salle St., Dept. No. D-20, Chicago, Ill.

SHINGLES—METAL

Cortright Metal Roofing Co., 50 North 23rd St., Philadelphia, Pa.
174. *"Concerning That Roof."* A complete catalog describing and illustrating Cortright Metal Shingles and Trimmings. 7 x 10¼ in. 32 pp.

SHOWERS, CURTAINLESS

Kenney-Cutting Products Corp., 507 Fifth Avenue, New York.
260. *4-page File and Reference Sheet* describing six different models of the shower.

SLATE—See also Roofing

Blue Ridge Slate Corp., Esmont, Va.
Knickerbocker Slate Corp., 153 East 38th Street, New York, N. Y.
485. *Four-page folder,* describing the "Graduated Slate Roofs."
F. C. Sheldon Slate Co., Granville, N. Y.
175. *Commercial and Architectural Roofing Slate* in all colors and textures. Also blackboards, structural and electrical slate. Slate Granules.
Vendor Slate Co., Inc., Easton, Pa.
*531. *The Vendor Book of Roofing Slate for Architects.* Contains original information on slate in various architectural uses; history, geology sundry practical matters; complete descriptive classificaton; extended treatise on architectural roof design and specifications. 24 pp. Ill. 8½ x 11 in.

STAIRWAYS

Bessler Movable Stairway Co., Akron, Ohio.
169. *Illustrated catalog,* containing 24 pp., describes how the Bessler Movable Stairway saves floor space and adds an extra convenience to the home.

STANDARD BUILDINGS

Truscon Steel Co., Youngstown, Ohio.
176. *Truscon Standard Buildings.* Fourth Edition. Catalog. 8½ x 11 in. 40 pp. Illustrated. Erection details, cross-section diagrams and adaptations are given.

STONE, BUILDING

Art Stone Co., Waynesboro, Pa.
170. *Descriptive circulars with illustrations* of different marbles in colors. Sent free to any interested party.

STORE FRONTS

J. W. Coulson Co., Columbus, Ohio.
278. Store Front Construction simplifies the problem for the builder and owner. It beautifies and enhances the value of store property. A special device prevents glass breaking.
Detroit Show Case Co., 1660 W. Fort Street, Detroit, Mich.
486. *Write for* "Full Size Details of Desco Metal Store Front Construction." This illustrates by means of blue prints the various store fronts.
Kawneer Co., Niles, Mich.
177. *Kawneer Store Front.* Illustrated catalog. Drawings and details of construction. Size 8½ x 11 in. 32 pp.
178. *Full Size Details Kawneer Construction.* Blue prints. Size 30 x 30 in.
179. *A Collection of Successful Designs.* Portfolio. Shows 24 typical store fronts with elevations. Size 9 x 12 in. 32 pp. Catalog B. J. 8. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STRUCTURAL STEEL

Central Pressed Steel Co., Massillon, Ohio.

STUCCO—See also Cement

American Materials Co., 101 Park Avenue, New York, N. Y.
487. *A 32-page illustrated catalog,* describing "Elastica," the Stucco of Permanent Beauty.
The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.
182. *The Stucco House.* Contains many beautiful illustrations of houses finished with stucco and selected particularly for their architectural value. Detailed illustrations of stucco surface, textures and drawings showing wall construction with revised specifications covering application of stucco. 96 pp. 8½ x 11 in. Price 50 cents.
180. *Guide to Good Stucco.* A book telling of the advantages of Portland Cement stucco, and how to apply it. Shows numerous finishes obtainable with ATLAS WHITE Portland Cement. 28 pages. 8½ x 11 in.
The Bishopric Mfg. Co., 17 Este Avenue, Cincinnati, Ohio.
Muller, Franklyn R. Co., Waukegan, Ill.
National Kellastone Company, 155 E. Superior St., Chicago, Ill.
183. *Specifications for Stucco Work.* A booklet containing complete specifications in detail for the use of Kellastone stucco for new buildings as well as the "overcoating" of old buildings. 13 sheets of text, 2 sheets of illustrations. 8 x 11 in.
184. *The Story of Kellastone Imperishable Stucco.* In this most interesting book the merits of Kellastone are set forth in a convincing manner. Every page contains pictures of beautiful houses stuccoed with Kellastone, and there are two pages in color. 22 pp. Illustrated. 8½ x 12 in.
Rocbond Co., Van Wert, Ohio.
268. *"Fortifies Your Home Against the Elements and Time."* 16-page folder. 3½ x 6 in.
269. *"Better Homes."* 12-page booklet, 7¾ x 8 in., describing the advantages of "Rocbond."

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Avenue, Cincinnati, Ohio.
181. *Bishopric for All Time and Clime.* Catalog. 7½ x 11 in. 52 pp. Illustrated. Describing the use of Bishopric Stucco and Plaster Base and Bishopric Sheathing.

STUCCO-MAGNESITE—See Stucco

American Materials Company, 101 Park Avenue, New York, N. Y.; Weed Street and Sheffield Avenue, Chicago, Ill.
185. *Elastica, the Stucco of Permanent Beauty.* Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.
Natl. Kellastone Co., 155 East Superior St., Chicago, Ill.
488. *An interesting handbook,* telling the story of "Kellastone."
489. *Catalog No. 100,* giving the specifications for Stucco Work.
United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

SURVEYORS' INSTRUMENTS—See Levels

SUSPENDED CEILING

U. S. Gypsum Company, 205 West Monroe Street, Chicago, Ill.
186. *Loose-leaf Bulletins.* 8½ x 11. Jester-Saskett, consists of plaster board applied to metal channels with special clip, ready for plastering.

THERMOSTATS—See Heating Equipment

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Building, Chicago, Ill.
187. *Handbook of Hollow Building Tile Construction.* 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.
National Fire Proofing Co., 250 Federal Street, Pittsburgh, Pa.
188. *Standard Wall Construction Bulletin* 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.
189. *Industrial Housing Bulletin* 172. 8½ x 11 in. Illustrated. Photographs and floor plans of typical workingmen's homes.
190. *Notes on the Farm.* 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.

TIMBER CLAMP

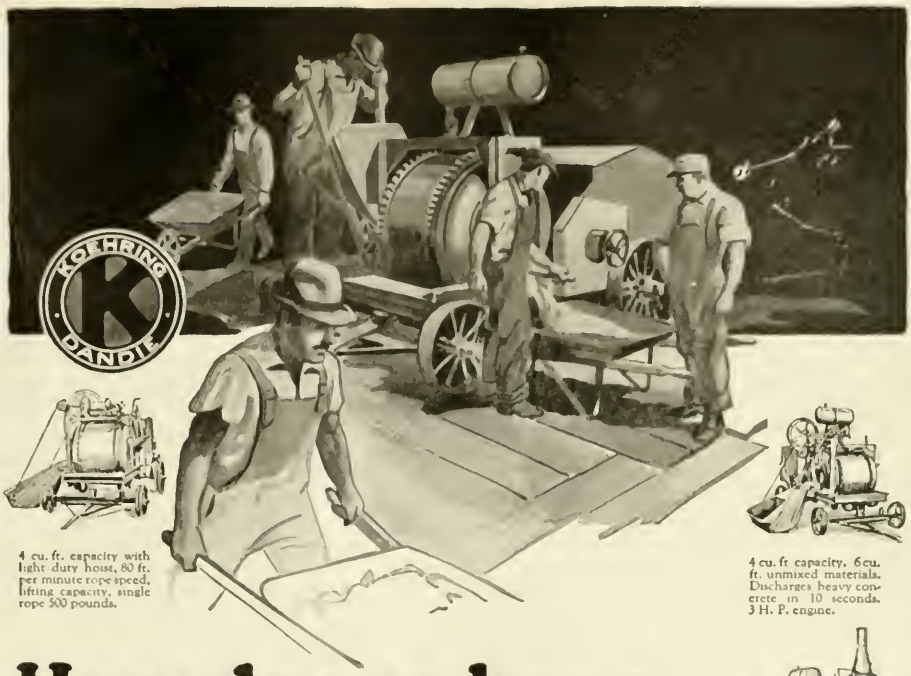
Schenck Timber Clamp Co., 501 Fifth Avenue, New York City.
490. *Several interesting descriptive folders* may be had on request.

TOILET PARTITIONS—STEEL

Hart & Hutchinson, New Britain, Conn.
284. Write for this Catalog, describing the sanitary and durable usages of these partitions.

TOOLS

Mack Tool Co., Inc., Rochester, N. Y.
491. *An interesting Carpenter's Catalog* may be had on request.
492. *"Love Stories,"* a lively booklet, bound to be pleasant and worth while reading.
Progressive Mfg. Co., Torrington, Conn

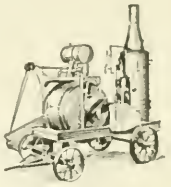


4 cu. ft. capacity with light duty hoist, 80 ft. per minute rope speed, lifting capacity, single rope 500 pounds.

4 cu. ft capacity. 6 cu. ft. unmixed materials. Discharges heavy concrete in 10 seconds. 3 H. P. engine.

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7 cu ft. capacity. 4 H. P. engine. 5 H. P. boiler.

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A light, easily portable mixer for footings, culverts, foundations, etc. Mixes concrete or mortar. As splendidly engineered as the big Koehring Paving Mixers. Great strength without excess weight! Double drum gear drive. Universal joint bearings. The Koehring heavy duty drum roller construction! Discharge controlled from either side. Extra liberal simple power. Genuinely, a trouble-proof mixer that stands up to all you can give it. Write for catalog.

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4 cu. ft. mixed concrete gasoline. 7 cu. ft. mixed concrete steam and gasoline.

May be equipped with low charging platform, power charging skip and light duty hoist.

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The Dandie is not the cheapest mixer you can buy, but the sturdiest, strongest construction which makes it the remarkable value in the light mixer field. Send back the coupon.

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Please send me Dandie catalog D4, and advise me where I can see a Dandie Mixer, also send me information on equipment marked with "X".

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Address_____

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 80*

493. *Twelve-page booklet*, describing the "Forstner Bits."
Sargent & Co., New Haven, Conn.
Stanley Works, New Britain, Conn.
494. *A 64-page catalog*, describing "Bronze and Steel Butts," by detailed drawings.
495. *An essential catalog* of 380 pages, giving the entire line of Wrought Hardware.
James Swan & Co., Seymour, Conn.
496. *An interesting 104-page catalog*, describing "Premium Mechanics' Tools."
The L. & I. J. White Co., Buffalo, N. Y.
497. *Catalog No. 19A* describes Carpenters' Tools.
498. *Catalog No. 20B* describes Coopers' Tools.

TRACTORS

C. H. & E. Mfg. Co., Milwaukee, Wis.
275. Bulletin No. 4, Tractors.

TRANSITS (See Levels)

TRUSS LOOPS

The Bostwick Steel Lath Co., Niles, Ohio.
279. *"Beautiful Permanent Walls,"* 22-page illustrated catalog.

VENTILATION

Danzer Metal Products, Hagerstown, Md.
Royal Ventilator Company, 415 Locust Street, Philadelphia, Pa.
193. *Descriptive Catalog* of round and rectangular ventilators made in galvanized iron, copper, etc. Illustrated.
E. G. Washburne Co., 207 Fulton Street, New York, N. Y.
194. *Illustrated Booklet* of metal ventilators, weather vanes, lightning rods, etc.

WALL BOARDS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.
195. *Descriptive catalog and sample of Linabestos Wall Board* for interior construction. Flame-proof and fire-resisting wall board.
Beaver Board Products Co., Inc., Buffalo, N. Y.
196. *Illustrated folder*, describing various uses and the methods of handling Beaver Board to the best advantage. Samples with descriptive literature sent on application.
Compo-Board Co., 5778 Lyndale Avenue, North, Minneapolis, Minn.
199. *Catalog sent on request with sample.* Describes many uses of Compo-Board.
United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.
201. *Walls of Worth.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Describes Sheetrock, the fireproof wall board, its advantages and uses.

WALL FURRING

United States Gypsum Company, 205 West Monroe Street, Chicago, Ill.
202. *Thirty-two-page Booklet.* 8½ x 11 in. Pyrobar. Tile.

WATER HEATER

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WATERPROOFING—See also Dampproofing

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
206. *Science and Practice of Integral Waterproofing.* Pocket size. 33 pp. Illustrated. Contains full specifications for waterproofing MASS Concrete, stucco and Cement Plaster Coat. Entire chapter devoted to "Practical Application of Waterproofed Cement Plaster Coat."
207. *Technical Pamphlet No. 8.* Booklet. 4 x 7 in. 28 pp. A discussion of why concrete requires waterproofing and the properties an integral waterproofing must possess to operate effectively with the natural properties of concrete.

WATER SUPPLY SYSTEM

Hardin-Lavin Co., 4538 Cottage Grove Avenue, Chicago, Ill.

WEATHER STRIPS

Allmetal Weatherstrip Co., 126 West Kinzie Street, Chicago, Ill.
239. Six-page illustrated circular, describing the product as used for Hotels, Residences and Institutions.
Diamond Metal Weatherstrip Co., Columbus, Ohio.
242. 34-page illustrated catalog. 8½ x 11¼ in. Containing blue prints of the various styles and sizes of Weatherstrip.
Monarch Metal Products Co., 5020-26 Penrose Street, St. Louis.
210. *Cause and Effect.* A series of pamphlets describing Monarch Metal Weather Strips, which are made of bronze, brass and zinc. They differ from all other strips in that they are applied in spaces around doors and windows as elastic fillers and not over the space as covers. Each 4 pp.

WEATHER VANES

Danzer Metal Products, Hagerstown, Md.
E. G. Washburne & Co., 207 Fulton Street, New York, N. Y.
211. *Descriptive Catalog in Colors.* Showing two different designs of weather vanes, lightning rods, ventilators, etc.

WINDOWS—METAL (See also Doors and Windows)

Detroit Steel Products Co., 2355 E. Grand Blvd., Detroit, Mich.
Hope & Sons, Henry, 103 Park Avenue, New York.
212. *Catalog.* 12¼ x 8½. 30 pp. Illustrated. Full size details of outward and inward opening casements.

WINDOW CASEMENTS

WINDOW HARDWARE

The Bridgeport Chain Co., Bridgeport, Conn.
266. *Interesting catalog* describing Sash Chains, Hooks and Sash Chain Attachments.
Casement Hardware Co., 250 Pelouze Bldg., Chicago, Ill.
The Kawneer Company, Niles, Mich.
213. *Kawneer Simplex Windows.* Catalog. 8½ x 10½ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installation in residences and buildings of all sorts.
214. *Detail Sheets and Installation Instructions.* Valuable for architects and builders.
Monarch Metal Products Co., 5020 Penrose Street, St. Louis, Mo.
282. 16-page illustrated catalog, 4 x 9 in., on Window Casements.
National Mfg. Co., Sterling, Ill.
500. *An interesting, well illustrated catalog.*
Pullman Mfg. Co., Rochester, N. Y.
502. *Catalog No. 37*, describing the "Unit Sash Balances."
Richards-Wilcox Mfg. Co., Aurora, Ill.
532. *Cement Window Hardware.* Booklet. 8½ x 11 in. 24 pp. Illustrated. Shows typical installations, drawings, details of construction (blue prints if desired). Describes Air Way multifold window hardware.
Samson Cordage Works, Boston, Mass.
501. *Catalog.* 3½ x 6¼ in. 24 pp. Illus. Covers complete line.
Sargent & Co., New Haven, Conn.
Stanley Works, New Britain, Conn.

WOODWORK

Hartmann-Sanders Company, 6 East 39th St., New York, N. Y.
533. *Catalog No. 47.* Illustrating Koll's Patent Lock Jointwood stave columns for exterior and interior use. 48 pp. Ill. 7½ x 10 in.

WOODWORKING MACHINERY

American Saw Mill Machinery Co., Hackettstown, N. J.
217. *Contractors' Bulletin No. 77.* Describing various types of portable Variety Woodworkers. General catalog No. 22, describing a general line of woodworking machines.
W. F. & John Barnes Co., 71 Rudy Street, Rockford, Ill.
218. *Catalog.* Containing description of rip and other machine saws, formers, mortises, tenoners, lathes. 38 pp. Illustrated.
C. H. & E. Mfg. Co., 259 Mineral Street, Milwaukee, Wis.
219. *Catalog* of portable saw rigs, pumps, compressors, engines, etc.
The Crescent Machine Co., 259 Main Street, Leetonia, Ohio.
220. *Catalog.* Describing band saws, shapers, jointers, planers, sorters, mortises, etc. 144 pp. Pocket size. Illustrated.
R. E. Kidder Co., 35 Hermon Street, Worcester, Mass.
222. *Catalog.* Describing improved boring machine and how it can be used.
Parks' Ball Bearing Machine Co., Sta. "A," Cincinnati, Ohio.
223. *Illustrated Folder.* Describing Parks' Planing Mill Special, comprising circular saw, jointer, band saw, shaper, borer, tenoner, etc.
J. D. Wallace & Co., 1401 Jackson Boulevard, Chicago, Ill.
325. *Bulletin No. 219-K.* Describes portable electric punch machines, tools, planers, jointers, circular saw, etc.
Woodworkers Mfg. Co., 614 Bush Street, Detroit, Mich.
263. 18-page *illustrated pamphlet*, 10¾ x 7¾ in., called "The Master Woodworker." The Model No. 7 machine is described.



